

# Powerful Career and Technical Education Instructional Practices

## Teacher Behaviors

## Student Behaviors

## Artifacts

### 1. The learning environment sets high expectations and uses the protocols of business and industry to promote and sustain student motivation, persistence and effort (*Culture of Learning*).

#### The teacher:

- Values, emphasizes and celebrates student effort to achieve rigorous technical, academic and workplace standards
- Creates a high-performance classroom culture and uses protocols and procedures that emulate the workplace
- Uses job titles and team structures commonly found in the workplace
- Models and conveys respect and professionalism by respecting students' unique needs, skills and interests and by valuing each student's diverse background
- Helps students persist through learning challenges by providing extra support — such as small group instruction, one-on-one meetings and instructional technology aids — and communicating expectations that students will re-do work that does not meet standards

#### The students:

- Help develop classroom expectations and use workplace protocols that enhance their productivity, efficiency and accountability
- Communicate workplace expectations and use the language of the career field
- Can articulate job and/or team assignment roles that emulate the workplace
- Interact with others in a professional manner and take care to address and avoid personal or regional biases
- Develop an understanding of their personal strengths, talents and interests
- Can articulate opportunities to:
  - enhance or expand their learning
  - improve the quality of their work
  - request and receive support for meeting classroom and industry expectations

#### Workplace-related artifacts:

- Reflect shared and co-developed class missions, visions and norms
- Communicate and reference industry protocols
- Include posted job duties, project management tools and leadership designations that replicate those in the workplace
- Include analyses of data that communicate and celebrate students' progress toward earning industry credentials (e.g., badging, certificates, etc.)
- Reflect a learning environment that replicates the workplace (e.g., through station set-ups)

#### Learning artifacts:

- Include anchor charts or rubrics that model and support professional, respectful interactions (e.g., question or feedback starters, collaboration tips, etc.)
- Spotlight exemplars of quality work that shows how students progress in their learning (e.g., drafts, revisions, etc.)
- Showcase profiles of students' talent and aptitudes
- Include syllabi that detail opportunities for students to receive support



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### 2. Planned, authentic units of study and summative tasks align with workforce expectations and allow students to demonstrate their mastery of technical, academic and employability skills (*Plan with the End in Mind*).

#### The teacher:

- Plans intellectually demanding units in which students assume authentic, industry-based roles to solve complex problems, think critically and master standards-based content-area and industry-recognized skills
- Plans a sequence of learning activities that allow students to connect prior knowledge, build and refine their conceptual understanding, practice developing skills and extend their learning to new situations
- Plans to facilitate learning by guiding students' inquiry process, assessing their understanding and providing personalized supports
- Plans and provides opportunities for students to engage in discourse about the concepts and processes they are exploring and learning
- Plans to continuously assess students' technical, academic and employability knowledge and skills to evaluate their progress and inform instruction
- Creates learning experiences that allow students to interact often with subject matter experts and build their conceptual knowledge

#### The students:

- Develop a product, create a method or test a theory using industry-recognized decision-making processes
- Conduct activities and experiments to make predictions, hypotheses and generalizations through observations, research and the use of technical tools and materials
- Engage in learning by problem-solving, seeking clarification and developing effective teamwork skills
- Engage in structured discussions that require them to use the technical language of the field
- Connect daily learning activities or goals to unit summative tasks as a means of communicating their progress
- Apply knowledge shared by subject matter experts to enhance the quality of their products and understanding of academic or technical content

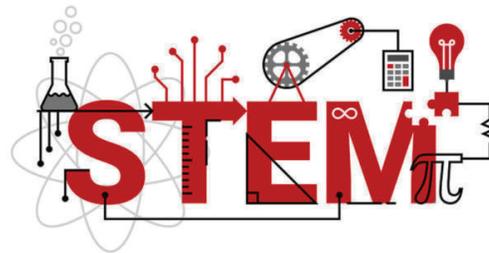
#### The teacher's plans:

- Identify standards or industry competencies
- Prioritize industry-valued resources for learning, including equipment, protocols and an industry-related problem-solving process
- Detail learning activities that build student knowledge and skills
- Include student resources that guide understanding (e.g., rubrics, organizers, process tools)
- Connect expected learning benchmarks with formative and summative assessments
- Describe expected student artifacts, designating potential portfolio components
- Connect key concepts or skills for subject-matter experts to address for achievement of unit goals or tasks



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<p><b>3. Intentional collaborations with teachers, families and business, industry, postsecondary and community partners enhance the relevancy of lessons and assignments and promote students' retention of the concepts, skills and competencies that are valued in the workplace (<i>Collaboration</i>).</b></p>		
<p><b>The teacher:</b></p> <ul style="list-style-type: none"> <li>• Creates authentic workplace scenarios with input from community partners that require students to work collaboratively and use problem-solving protocols to build an understanding of interpersonal and group dynamics</li> <li>• Strategically places students into working teams or groups and uses structures like job duties to support interactions</li> <li>• Establishes clear expectations for student collaboration and intentionally teaches collaborative skills by modeling and/or using descriptive rubrics to guide student behavior</li> <li>• Models and creates authentic opportunities for students to use technology to present their ideas and collaborate on project management</li> <li>• Provides students with opportunities to reflect and receive structured feedback on both their individual and group contributions</li> <li>• Uses students' strengths in ways that support collaboration and offer opportunities to refine and strengthen their knowledge and skills</li> </ul>	<p><b>The students:</b></p> <ul style="list-style-type: none"> <li>• Describe how they are expected to collaborate in the workplace using unit scenarios and protocols</li> <li>• Understand their roles and responsibilities within a team and show a personal willingness to contribute or make compromises in order to achieve shared goals</li> <li>• Demonstrate an understanding of interpersonal and group dynamics in their interactions with peers, teachers and business, industry, postsecondary and community partners</li> <li>• Use technology as a tool for collaboration (e.g., virtual collaborative meetings, project management software, digital shared resources, etc.)</li> <li>• Assume shared responsibility for collaborative work and respect and value the individual contributions made by each team member regardless of the role they hold within the team</li> </ul>	<p><b>Classroom documents:</b></p> <ul style="list-style-type: none"> <li>• Show evidence of students' collaborative efforts both in school and in the workplace</li> <li>• Spotlight team or group assignments and related job duties</li> <li>• Include rubrics or anchor charts that communicate expectations for student collaboration</li> <li>• Showcase artifacts from peer or group evaluations</li> <li>• Reflect students' use of collaborative or project management tools and technologies</li> </ul>



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### 4. Integration of relevant literacy, math and science concepts and skills helps students deepen their understanding and transfer skills across academic and technical disciplines and career fields (*Academic Integration*).

#### The teacher:

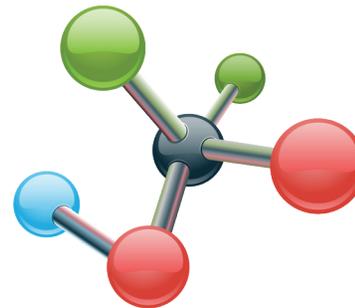
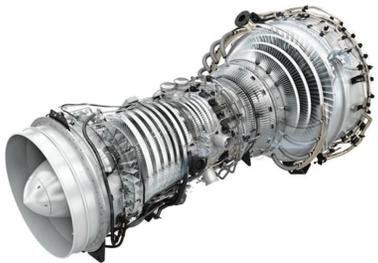
- Plans and implements ongoing opportunities for students to apply academic knowledge in literacy, math or science to gain a deeper understanding of CTE content
- Plans and implements classroom scenarios that use literacy, math and science skills in authentic situations found in the workplace
- Uses questioning strategies to engage students in guided inquiry lessons that make connections to learning experiences in literacy, math or science
- Identifies students' understanding of academic and technical content using formative (i.e., ongoing, dynamic) and summative (i.e., end-of-lesson final tests or products) assessments
- Collaborates with other teachers, including academic teachers or instructional coaches, to use common content-area language, resources and strategies to emphasize the academic skills used in the workplace

#### The students:

- Describe connections between academic and CTE knowledge and skills
- Apply appropriate literacy skills, including the reading, writing, speaking and listening skills related to the career field
- Apply mathematical reasoning to solve problems and communicate how math is used in the career field
- Use scientific, engineering or other design processes to guide their analysis and development of solutions to authentic workplace problems
- Demonstrate mastery of technical, academic and workforce standards in completed projects or assessments

#### The teacher's plans:

- Identify opportunities to integrate academic content and/or the use of:
  - scaffolded texts to support reading technical materials
  - common math and science resources, including the vocabulary and processes used in the career field
  - mini-lessons or skill-building activities that address how academic skills are used in the career field
  - opportunities to co-deliver academic core content with other teachers
- Include formative and summative assessments of academic content
- Identify literacy, math and science artifacts that students can include in portfolios that document their mastery of academic knowledge and skills



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### 5. Opportunities to engage in experiential learning\* using industry-standard technology and equipment empower students to apply what they learn in the classroom or lab to solve authentic workplace problems (*Experiential Learning*).

#### The teacher:

- Uses workplace expectations to demonstrate the knowledge and skills students will need to master in their CTE program
- Draws upon available resources (e.g., equipment, supplies, instructional tools, etc.) and project management tools related to the CTE program area
- Showcases how academic and technical concepts and skills are used in student work-based learning opportunities and/or teacher externship experiences
- Uses an industry-recognized problem-solving process that emphasizes continuous improvement
- Creates opportunities, either in person or through conferencing tools, for students to seek feedback on proposed solutions or products from content area experts
- Uses co-curricular career-technical student organizations, competitions and protocols to help students develop academic, technical, workplace and leadership skills

#### The students:

- Understand and can apply essential employability skills like time management, teamwork, reliability and personal initiative in authentic situations
- Use relevant technology and equipment and demonstrate effective, industry-standard workplace practices
- Can describe the connections between the classroom, lab and workplace
- Conduct research, develop a product, create a solution or prove a theory using an industry-recognized problem-solving process
- Demonstrate resourcefulness by seeking feedback on their projects or products from business, industry, postsecondary and community partners
- Understand and can describe the connections between co-curricular learning opportunities and classroom skill attainment

#### Classroom artifacts:

- Spotlight resources students can use to learn key concepts
- Include reports from project management tools
- Showcase videos, pictures or how-to guides for using equipment appropriately
- Highlight students' reflections on how learned skills can be used in the workplace
- Include feedback forms or examples of questions and responses from industry and content-area experts
- Include student products that document the use of industry-standard problem-solving processes

\* *Experiential learning* is here defined as opportunities for students to apply concepts and skills learned in the classroom to solve authentic problems in the laboratory or other applied settings and ultimately to solve problems in the workplace.



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### 6. Rigorous assessments and learning activities allow students to receive feedback from teachers, peers and authentic audiences, engage in personal reflection and apply their understanding of academic, technical and workplace knowledge and skills to solve authentic problems (*Assessment and Feedback*).

#### The teacher:

- Provides a sequence of formative assessments — both written and hands-on performance tasks — to monitor student learning and provide feedback
- Models the professional skills needed for workplace success and offers ongoing assessments that help students demonstrate their mastery of these skills
- Provides targeted feedback that helps students advance their learning
- Facilitates opportunities for students to reflect on their learning with themselves, their peers, their teachers and business, industry, postsecondary and community partners
- Engages with business, industry, postsecondary and community partners to ensure that ongoing formative and summative assessments align with workforce expectations

#### The students:

- Demonstrate their learning through performance-based assignments and assessments
- Self-assess and share their progress toward the attainment of technical skills
- Use feedback to refine and improve the quality of their projects or products
- Offer, receive and reflect on feedback from teachers, peers and business, industry, postsecondary and community partners
- Identify goals and next steps for improvement based on formative and summative assessments and feedback from teachers, peers and business, industry, postsecondary and community partners

#### Artifacts:

- Highlight the progression of learning, including:
  - Analysis of tasks or prompts
  - Annotated research samples
  - Initial design or prototype notes
  - Teacher and peer feedback with strengths and opportunities for improvement
  - Prototype iterations with collected data
  - Feedback from guests or industry experts
  - Final products with notes designating improvements made
- Showcase samples of student work related to performance tasks and summative and formative assessments
- Includes examples of student feedback forms and protocols
- Communicate the progression of learning within a unit as it relates to the course and program
- Spotlight students' reflections on the progress they have made toward attaining their career and academic goals



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