Montana

Big Sky Pathway Implementation Guide
The Big Sky Pathway Implementation Guide is a living document, and will change over time, as we discover improvements and innovations. Please send suggestions or revisions to: maskelson@montana.edu

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Part I. Career Cluster Framework

**Why are Career Clusters and Career Pathways Important?**

Career Clusters—The 16 Career Clusters provide a context for learning the skills specific to a career, and provide a structure for organizing or restructuring curriculum offerings and focusing coursework with a common theme such as an interest or aptitude.

**Career Cluster Framework:**

The career cluster framework provides a sequential path for students to take a career interest and develop it into job potential. The 16 broad career clusters are broken down into 79 specific pathways. Students will be able to learn about multiple careers within each pathway and choose one program of study, or “Big Sky Pathway” available in their school, which will be developed through the process, laid out here. That program of study will be tied to community needs, specific partnerships, and a sequence of courses which will provide a channel for students to move seamlessly from high school to a postsecondary institution.

**Career Clusters:**

- provide a framework for continuing, cutting-edge, high-quality programs of college and career preparation;
- provide a framework for seamless education from high school through postsecondary;
- provide more career and educational options for students;
- provide a framework for organizing and reorganizing the delivery of career and technical education and skills for the 21st century;
- provide a framework for knowledge and skill transfer as well as verification of qualification.

The 16 Career Clusters are categorized into career groupings with shared knowledge, skills, and dispositions required to be successful in careers within the pathway. 79 Career Pathways are contained within these 16 career groupings. They are the core of workforce and economic development in Montana.

**Career Pathways:**

- promote the connection between education and workforce/economic development;
- offer a seamless transition from high school to career or occupation preparation;
- focus on high skill, high demand, and high wage careers;
- provide a plan for attainment of a technical skill proficiency and an industry-recognized credential, certificate or degree.
Career Pathways are critical to 21st century schools and learners. Each pathway is grounded in a set of four guiding principles:

1. **Career Pathways prepare students for postsecondary education and careers.** A Pathway is always about both objectives; it’s never a choice between one or the other. The probability of making a living wage in today’s economy without some form of postsecondary education is already low and will only diminish. Increasingly, career success depends on postsecondary education and gaining and regaining formal credentials—a certificate, associate’s degree, bachelor’s degree, or higher level of achievement. Gone are the days when secondary educators could be content preparing some students for college and others for work.

2. **Career Pathways connect academics to real-world applications.** Each Pathway integrates challenging academics with a demanding career and technical educational curriculum. Pathways alter how core academic subjects are taught; they do not lower expectations about what is taught, on the contrary, they increase academic rigor. Through the Pathways approach, students are expected to achieve at high levels in mathematics, science, English, social studies, and world languages. Students master these subjects through the power of real-world application—their learning is challenged by authentic problems and situations that are part of the modern workplace. Students also have the opportunity to be part of work-based learning and youth apprenticeship, both of which lead to industry-recognized credentials.

3. **Career Pathways lead to the full range of postsecondary opportunities.** Pathways prepare students for all the avenues they might pursue following high school graduation—two- and four-year college, certification programs, apprenticeships, formal job training, and military service. Each Pathway represents a broad industry theme that can appeal to and engage a student regardless of prior academic achievement and postsecondary aspirations. Pathways can eliminate current practices which sort and track high school students in ways limiting options after high school. With careful attention, pathways can ensure all students from all backgrounds and experiences can succeed in the future workforce. A stronger workforce and a vibrant economy is based on diverse contributions and perspectives, and social justice for all in our communities. Core skills to be addressed through Pathways include cultural understanding and competence, global and diversity awareness, and fairness/inclusiveness skills for students.

4. **Career Pathways improve student achievement.** Pathways and Programs of Study are based on accountability for achievement. They are designed to produce higher levels of achievement in a number of measurable arenas, including academic and technical scores, high school completion, postsecondary transitions to career and education, and attainment of a formal postsecondary credential. They also contribute, in ways that most conventional academic and career and technical education curricula do not, to increase student proficiency in vital areas such as creativity and innovation; critical thinking and problem solving; communication; collaboration; diversity competence; creativity and problem solving; and media and information literacy. Additionally, student engagement in Pathways makes an immediate difference—helping young people gain higher earnings right after high school and giving students a leg up in the labor market while pursuing postsecondary education.
The following graphic is a detailed look at how all these pieces fit together.

**Career Cluster Framework**

Career Clusters are broad occupational groupings based on a set of common knowledge and skills required for a broad group of careers. Montana has adopted the National 16 Career Clusters that also serve as a tool for organizing curriculum and instruction. Career clusters provide opportunities for all students regardless of their career goals and interests. They are a tool for a seamless educational system that blends rigorous academic/technical preparation, provides career development, offers options for students to experience all aspects of a business or industry, and facilitates/assists students and educators with ongoing transitions.

Career Pathways are a sub-grouping of careers used as an organizing tool for curriculum design and instruction. Similar to career clusters, career pathways are grouped based on their requirements for a set of core and similar knowledge and skills for career success. Each pathway highlights a specific part of each cluster. An easy example of this can be seen in the example below using Manufacturing Cluster.

A Big Sky Pathway, or Program of Study is a specific career pathway, defined by a local school/district partnership, which is a sequence of instruction based on recommended standards and knowledge and skills, consisting of coursework, co-curricular activities, worksite learning, service learning and other learning experiences including Career and Technical Student Organizations (CTSO). The sequence of instruction provides preparation for a career, and results in an industry-recognized credential, certificate, or degree.

**Example:**

**Career Cluster** - Manufacturing

**Career Pathway** - Maintenance Installation and Repair

**Big Sky Pathway (Program of Study)** - Electro-Mechanical
The 16 National Career Clusters:
Part II. The Ten Components of a Big Sky Pathway (Program of Study)

The Ten Components of Program of Study implementation offered in this guide are from those published by the Office of Vocational and Adult Education (OVAE), U.S. Department of Education. OVAE’s components are developed in collaboration with major national associations, organizations, and states.

These components are like building a brick foundation—each component is important and provides part of the foundation needed for a successful framework for Program of Study Implementation in Montana. Working through the framework, educators and program staff can build a successful program of study.

See more information on the OVAE model here:
http://cte.ed.gov/nationalinitiatives/rposdesignframework.cfm

The following section will take an in-depth look at the Ten Components of Program of Study Implementation. Each component is thoroughly investigated and a step-by-step analysis of the Program of Study Implementation process is included.

Those not familiar with the Program of Study implementation may utilize this section of the guide more than those with more experience in the process. For others, it may provide a refresher to make sure that each component is thoroughly implemented at each step in the process.
College & Career Readiness Standards

Content standards that define what students are expected to know and be able to do, enter, and advance in college and careers are at the core of Program of Study development and implementation. These standards—contributed dually through local and regional discussion with education and business partners as well as through key national initiatives, such as the Common Core State Standards for CTE, provide a consistent, clear understanding of what students are expected to learn so teachers and parents know what they need to do to help them succeed.

Essential Elements

- **Develop and continually validate College and Career Readiness Standards in collaboration with postsecondary and industry partners, as well as with secondary colleagues.**

  Utilizing a well-developed partnership, secondary and postsecondary educators should align and collaborate on defining and validating standards required of students upon the multiple exit points on a career pathway. When students transition to a career or postsecondary institution, clear standards or expectations of the skills the student will have for success should be clearly spelled out. Information on national college and career readiness standards can be found at: [http://www2.ed.gov/policy/elsec/leg/blueprint/faq/college-career.pdf](http://www2.ed.gov/policy/elsec/leg/blueprint/faq/college-career.pdf)

- **The focus of discussions among secondary, postsecondary, and industry partners should be to create coherent, non-duplicative sequences of coursework through which students make progress without repetition or remediation.** Many programs of study will allow students to earn college credit while still in high school, but all programs of study should be designed to eliminate the remedial coursework students are often required to take in college. “National data from the U.S. Department of Education on
participation in remedial education found that 34% of all new entering college students required at least one remedial education class. Of those students who enrolled in a community college, 43% required some remedial education, and at least 40% of high school graduates need remedial coursework when they get to college.” (Vandal, 2010). Effective Career Pathway development can help Montana students avoid remediation and continue progress in their chosen career field.

- **Incorporate essential knowledge and skills (i.e., academic skills, communication, and problem solving) which students must master regardless of their chosen career area or Program of Study.**

  The most recent and most widely-supported work on knowledge and skills that are essential for American students is the Common Career Technical Core initiative. The Common Career Technical Core (CCTC) is a state-led initiative to establish a set of rigorous, high-quality standards for Career Technical Education that states can voluntarily adopt. Montana is one of 47 states that have committed to adopting the CCTC, which were informed by state and industry standards and developed by a diverse group of teachers, business and industry experts, administrators and researchers.

  The CCTC includes a set of standards for each of the 16 Career Clusters and their corresponding Career Pathways that define what students should know and be able to do after completing instruction in a program of study. The CCTC also includes an overarching set of Career Ready Practices that apply to all programs of study. The Career Ready practices include 12 statements that address the knowledge, skills, and dispositions that are important to becoming career ready. Educators should incorporate this career-ready baseline, along with standards as a starting point for discussions on the curriculum design for pathways.

- **Incorporate industry-recognized technical standards that are valued in the workplace.** In addition to core academic skill mastery based on standards, each given Pathway should provide opportunities for students to gain technical mastery. The technical mastery is defined with the assistance of the Career Pathway team and includes input from business and industry representatives. As skills evolve or change due to industry expectations, the team should incorporate ongoing input into the technical skill standards to ensure students leave their respective institutions with the skills to succeed.
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<th>College and Career Readiness Standards</th>
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<th>In the Planning Stage</th>
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<td>2. Focus on reducing or eliminating common remediation needs of entering college students.</td>
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Part III: Implementing a Big Sky Pathway

**Partnerships**

Cultivating partnerships is fundamental to successful career clusters and pathways framework in Montana school districts and postsecondary institutions. There are two types of partnerships that are essential: *internal* and *external*. Partnerships should include relationships within the school and/or district and/or postsecondary institution in the form of curriculum alignment and integration. Relationships with constituents from business and industry and other civic entities or professional organizations within the community should be included. Identifying representatives from both internal and external sources to formulate a career pathway team will ensure support and buy-in that will help to manage and administer Career Cluster and Pathway framework development and implementation.

**Steps**

- **Plan and elaborate on the purpose, goals, and mission of partnerships.**
  Successful career pathway team partnerships begin with clear documentation. The school/district/postsecondary institution should determine broad goals and intended outcomes of partner relationships and put them in writing to serve as the partnership’s mission/purpose. Next, create written documentation describing the roles and responsibilities of each individual/organization involved in a specific partnership. Without this documentation, roles, responsibilities, and expectations are unclear.

- **Conduct ongoing analysis of economic and workforce trends.**
  Education professionals cannot make effective decisions about local, regional, or statewide Career Pathways to be created, expanded, or discontinued without being fully informed about current and future economic and workforce trends. It is up to education professionals to be knowledgeable about jobs within the economy that each career pathway serves. Secondary teachers and school counselors along with postsecondary faculty and academic advisors must inform students and parents about those current and future trends. This includes teaching students and parents how to find and interpret job information and trends as part of an assignment, or through student-parent career planning sessions.
The Research & Analysis Bureau of the Montana Department of Labor website (http://www.ourfactsyourfuture.mt.gov/) offers pertinent workforce resources for Montana and is a good place to gather career projection data. This site contains a variety of labor market information, including regional information, industry, wage, and occupational data, current publications, and other employment information. Remember that the Career Cluster and Pathway framework which focus on careers may actually prepare students for several jobs within a cluster and/or Pathway.

**Link to existing local, regional and/or state initiatives promoting workforce and economic development.**

Education professionals should work with other education, business and industry, and workforce and economic development partners to identify existing and ongoing industry sector planning strategies and activities.

- Connect with local and/or regional workforce and economic development corporations.
  - [http://businessresources.mt.gov/CRDC/crdc_map.mcpx](http://businessresources.mt.gov/CRDC/crdc_map.mcpx)

- Become involved in chamber of commerce and other civic organization activities to find out what is going on in the community/region,
- Consider how education can get involved to further enhance existing initiatives.

**Identify, validate, and continue to update the employability, technical, and work-readiness skills attained within a Career Pathway.**

The career cluster and pathway team should conduct research about current and future economic and workforce trends and should identify existing local/regional initiatives and examine existing credentials and certifications within pathways to determine if they are still relevant to current business and industry practices.

Once the career cluster and pathway team has identified a Career Pathway, the school/district should establish an advisory council or board. Depending on population and geographic location, the school/district may wish to partner with other schools/districts to create regional advisory boards, or may wish to partner with an existing two-year, community or tribal college advisory board. Advisory committees should consist of secondary and postsecondary educators as well as members of the business and industry sectors and civic leaders who are vital to the local community and/or region.
Part III: Implementing a Big Sky Pathway

Partnerships

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<td>4. Identify, validate, and continue to update the education, employability, technical- and work-readiness skills and certifications that should be attained within a Career Pathway.</td>
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**Professional Development**

Professional development in a successful Career Clusters and Pathways program contains opportunities for administrators, teachers, school counselors, and other education professionals and stakeholders to implement and evaluate career cluster and pathways. Professional development is necessary at every level of implementation and should be provided to help teachers and other partners learn more about programs of study.

**Steps**

- **Support the alignment of curriculum using national, state, and industry standards.**
  Professional development opportunities must allow for a team approach to Career Cluster and Pathway research, development, implementation, and revision. The Career Cluster and Pathway team should consist of school counselor(s), core academic teachers and faculty, Career and Technical (CTE) teachers and faculty, district CTE coordinators, a curriculum coordinator, business and industry representatives, postsecondary partners, (including academic and occupational instructors/faculty and academic advisors) and legislators.

Successful Career Cluster and Pathway teams need concentrated time together to evaluate the knowledge and skill statements within a Career Pathway and to align curriculum around the standards model. Then, the team plans the curriculum from secondary through postsecondary, beginning at grade 9. It is critical for secondary and postsecondary partners to work together on the curriculum planning. More often than not, secondary, postsecondary, and business and industry partners are unaware of what the other is doing. Therefore, one of the first activities a career cluster and pathway team should engage in is the examination and alignment of the knowledge and skills statements to determine if the existing curriculum has consistent and relevant standards; course syllabi and objectives; and program competencies or outcomes. Here is a sample agenda for a local professional development day.

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**Career Cluster and Pathway Professional Development Agenda**

- Welcome and Introductions
- Overview of Career Clusters and Pathways
- Review of Labor Market Data and Selection of a Pathway
- Review of Knowledge and Skill Statements
- Analysis of Existing Curriculum
- Identification of Gaps in Curriculum
- Development of Plan to Address Gaps
- Adjourn
Support the development of integrated academic and career and technical curriculum and instruction.

When the Career Cluster and Pathway team convenes to examine and review knowledge, skills, standards, and curriculum, the team must also work to integrate academic and career and technical coursework. This provides the whole picture of where in the curriculum the knowledge and skills required of the Pathway is being obtained or taught. This process is considered a horizontal curriculum alignment and is critical because many education professionals teach courses in isolation, without knowing what their colleagues teach or how course content fits into the entire curriculum or relates to content from other courses. Research indicates concepts and information are best taught in context. All education professionals are challenged to seek ways to integrate course content and partner in instruction in order to help students learn in context and see connections in what they are learning (see Teaching and Learning).

Ensure teachers and faculty have the content knowledge to align and integrate curriculum and instruction.

The academic and career and technical integration just described does not happen automatically. Many education professionals have performed curriculum development and instructional responsibilities in isolation for so long; they are often uninformed about what is going on outside their classroom walls. It is also a difficult and long process to really affect change, as people tend to revert back to that which is comfortable and familiar. However, now is the time to begin by providing teachers with professional development opportunities to update knowledge and skills within specific content areas. Without these opportunities, curriculum updates and changes to instructional delivery does not happen. Further revisions may not be based on research, evidence, and current practice which would be a severe disservice to students and other stakeholders being served.

Examples of professional development opportunities:

- National conferences such as the Career Cluster Institute, National Career Pathways Network conference, or other Pathways Focused Conferences
- State Conferences
- Industry Conferences
- School staff meetings

Provide multiple resources for professional development, locally, regionally, statewide and/or nationally.

Local school/district and postsecondary administrators should assist teacher professional development by making resources available and helping to locate growth opportunities. In addition to local and regional opportunities, professional development experiences outside the district and/or region should be encouraged to broaden perspectives and expand ideas beyond that which is already familiar, along
with encouraging best practices collaboration with other state programs. If funding for professional development is limited in school districts and postsecondary institutions, external grant funding sources should be sought to support these initiatives.

- **Offer professional development credit or graduate credit as an incentive for participation.**

  Local school districts and postsecondary administrators should work with postsecondary partners to offer professional development or university or college credit as an added incentive for teachers and faculty to participate in training. If credit is not offered, teachers can seek out postsecondary institutions willing to offer graduate or undergraduate independent study credit for the experience.

Education professionals can update their knowledge and skills in their content areas by participating in professional development activities such as:

- Work experience or externships
- Content-specific state and national workshops, conferences, or seminars
- State or district task forces, review teams, or program reviews
- Professional service as a chairperson or member of professional or community service organization board
- Graduate, undergraduate, or continuing education courses
- Industry or occupational certification/licensing
- Business and industry site visits
- Postsecondary classroom observations
- Community service
- National or international study tours
1. Support the alignment of curriculum using national, state, and industry standards.

2. Support the development of integrated academic and career and technical curriculum and instruction.

3. Ensure teachers and faculty have the content knowledge to align and integrate curriculum and instruction.

4. Provide multiple resources for professional development, locally, regionally, statewide and/or nationally.

5. Offer professional development credit or graduate credit as an incentive for participation.
Teaching and Learning

Students come to any classroom environment with both preconceptions and misconceptions. It is important for every educational professional to learn about these conceptions and use them to help students successfully learn. To do this, educators must draw from current research on student learning and apply that to the classroom; use research and apply it to instructional practices and designs; and finally, use research to help all students achieve their fullest potential. (NRC, 1999) With these key ideas in mind, effective learning takes place when:

- The transfer of learning occurs and skills and knowledge are extended beyond the original learning context,
- Learners know when, where, and how to use the learned concepts,
- Learning is guided by general principles or big ideas,
- Learners understand how individuals learn, and
- Learners acquire conceptual knowledge in order to successfully make independent learning attempts.

Course and career pathway content should be delivered in a manner requiring students to be engaged with the content, engaging students with each other and with the teacher. Engaging learners means that “all student activities involve active cognitive processes such as creating, problem-solving, reasoning, decision-making, and evaluation. In addition, students are intrinsically motivated to learn due to the meaningful nature of the learning environment and activities.” (Kearsley & Shneiderman, 1999)

Not only is instructional delivery important, but the school district or postsecondary institution should have an established process to review, evaluate and revise course content and examine and update course sequencing. Without such an internal system for curricular checks and balances, your school district or postsecondary institution curriculum may be out-of-date and misaligned with business and industry needs.

Steps

Focus on rigor and relevance for diverse students.
Teachers should aspire to establish a classroom environment that teaches students with high rigor and high relevance. Doing so causes education professionals to strive for excellence in the areas of curriculum, instruction, and assessment. An academically rigorous curriculum should be coherent across grade levels; meet state and district and postsecondary institution graduation requirements; teach analytical thinking, learning, comprehension, and writing skills; and integrate the knowledge and skills needed for students to pursue postsecondary options and be prepared for the workplace.
Vary instructional strategies and employ contextualized work-based, project-based, and problem-based learning approaches along with multiple assessments.

It is important to deliver course content in a variety of different ways to insure diverse student learning styles are addressed. In a joint study, six organizations representing over 250,000 content teachers, administrators and others came together to unite behind six principles for learning. They determined educators must know the core concepts of their discipline if they are to help students grasp new ideas, solve problems, collaborate, and use their imaginations to pursue challenging questions. These groups determined:

- Being literate is at the heart of learning in every subject area
- Learning is a social act
- Learning about learning establishes a habit of inquiry important in life-long learning
- Assessing progress is part of learning
- Learning includes turning information into knowledge using multiple media, and
- Learning occurs in a global context

It is easy to see how this could easily be a true fit for teachers to tie this into Program of Study implementation as well. For more information about this study, please see http://www.principlesforlearning.org/

In addition, research on good teaching and learning verifies traditional lecture delivery alone does not help students learn at a deep level or retain information/concepts for very long. Teachers must vary delivery of the course content to actively engage learners in newer forms of delivery such as project-, problem-, and challenge-based learning. Students learn more and will retain what is learned when teachers require them to apply, analyze, evaluate, and create through instructional delivery techniques utilizing student demonstration, student discussion, student practice, and students teaching others. Education professionals need to listen to students about what inspires them and how to best learn how to adapt instruction and customize assignments to meet a variety of needs.

When a variety of instructional delivery techniques are used in teaching, teachers also need to assess student learning differently. Traditional texts and quizzes are comprised of true-false, multiple-choice, and matching questions are often used to assess learning from lecture or reading. However, when teachers create a student-centered classroom focusing on active learning, a variety of formative and summative evaluation tools aligning with that style of delivery must be used. Teachers should evaluate both the learning process as well as learning outcomes. Teachers should evaluate mastery of academic as well as technical and employability skills at various points.

Immerse diverse students in school and community partnerships.

Responsibility for student learning cannot rest solely on the classroom teacher. Instead, a variety of individuals must assume shared responsibility for developing and growing students into well-rounded, productive members of society who will be able to live and contribute to the local, regional, and state economy. Therefore, a team approach to developing, creating, and implementing a Career Pathway must be used. For more information, see the chapter on Partnership in Section 3 of this document.
Parents, business/industry partners, and advisory committee members provide a wealth of knowledge and can assist teachers in developing rigorous, real-world assignments.

Classroom learning should also span disciplinary boundaries. For example, teachers may use cross-curriculum teaching methods such as “Literacy in Career Technical Education (CTE)”, where students in a CTE class may create written technical documentation relating to course content that is then reviewed and edited by students in a writing class. Another way to immerse students in partnerships is to offer and involve students in career and technical student organizations (CTSOs – See Appendix).

- **Infuse technology as a natural extension of the content.**
  An essential component of 21st century skill outcomes for all individuals pursuing postsecondary options and/or entering the military or workforce is the utilization of technology. Furthermore, today’s students live with digital access to tools and resources that aid in learning. Teachers can capitalize on the use of these tools to empower young minds and enhance creativity, innovation, and learning. Students can create a digital story, a wiki, a blog, or a web page instead of a traditional written or oral report to document learning and intended assignment outcomes. What is even more exciting than the technology itself is that students can engage in collaborative learning to teach each other how to learn and use those technologies.

- **Incorporate team-building, critical thinking, and communication skills through the use of career and technical student organization (CTSO) or similar student organization activities.**
  Teachers should require diverse students to relate to each other through collaborative learning. When students have opportunities to relate to other students, engage in critical employability skills such as oral and written communication, planning, problem-solving, critical and analytical thinking, and teamwork, they are naturally engaged. In addition, employers demand expert thinking and complex communications, so when teachers require students to engage in the scientific method collaboratively to solve problems, student motivation to learn increases and students are exposed to diverse perspectives they would not have considered if they worked independently. This type of classroom environment also fosters creativity and innovation.

Not only can students learn academic, technical, and employability skills from collaborative, real-world course assignments, students can also master critical skills employers demand when they participate in co-curricular activities such as career and technical student organizations. In a career pathway, teachers and other education professionals should expect and encourage student participation in activities in and beyond the classroom environment to bridge the gap between formal and informal learning. CTSOs are essentially an extension of the classroom environment and student participation in such organizations as a part of individual Career Pathways will enhance learning in the areas of reading, writing, analytical thinking, reasoning, problem solving, and teamwork.

- **Attract, prepare, and support each and every student and ensure equitable outcomes for different student groups.**
  If properly designed and implemented, a career pathway should open doors for and attract numerous students, regardless of academic or social abilities, socio-economic status, ethnicity, or gender. In addition, all students need to be provided with academic and social supports to be successful.
throughout the career pathway. The career pathway team must ensure there are adequate academic support mechanisms in place that incorporate school district and postsecondary institutional resources and practices such as regular and ongoing interaction between students and school counselors/advisors, etc. Also, the school district or postsecondary institution, a system should be in place to identify and engage students who are falling behind or at risk of falling behind and provide academic interventions that support successful student outcomes.

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<td>Incorporate team-building, critical thinking, and communication skills through the use of career and technical student organization (CTSO) or similar student organization activities.</td>
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<tr>
<td>Attract, prepare, and support each and every student and ensure equitable outcomes for different student groups.</td>
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Accountability and Evaluation Systems

Evaluating programs and ensuring accountability for decisions made is critical in career cluster and pathway implementation. Simple questions asked such as “Do these efforts have an impact?” are good to keep in the forefront in an accountability and evaluation system.

The data obtained can be informal and formal. Data can be qualitative and quantitative. The data considered in the accountability and evaluation design should be for a regular, systematic data collection so decisions and improvements can be made. Formal data collection systems in which data elements are currently collected should be integrated into the accountability and evaluation system for Career Cluster and Pathway implementation as well as incorporating essential new data elements. Examples of state-level data systems to consider when creating an evaluation design include:

- Montana Office of Public Instruction: [http://opi.mt.gov/Reports&Data/Index.html](http://opi.mt.gov/Reports&Data/Index.html)
- Local School District Data

Education professionals need to build their own evaluation and data collection systems, including informal ways which support holistic views of Career Pathway implementation. It is imperative for individual teachers and school counselors to work with school and district personnel as well as postsecondary partners to collect necessary data for decision making and continuous improvement.

Steps

- **Identify and design an accountability and evaluation system which will meet the needs of federal and state regulation as well as provide timely evaluation information to all stakeholders.**

  Education professionals should keep the end in mind when designing the evaluation system, which should align with the purpose of implementing Career Clusters and Pathways. Questions answered in the accountability and evaluation system will include the impact of the program of study on student achievement and engagement as well as meeting the local or regional workforce skill requirements.

  Evaluation systems should answer questions such as, “How many students are engaged in a specific Pathway?”; “What are the course completion and graduation rates for students?”; or “What are the rates of remediation at the postsecondary level?” Information should be gathered from business and industry regarding whether our students are coming to them fully prepared with the skills for the
occupation. Data charts should include information education professionals can use to make data driven decisions.

- **Examine data already collected to determine if there is existing data collection and elements to be used in the accountability and evaluation system of Career Pathway implementation.**

  Student achievement information originates from data sources such as state standardized exams, the American College Testing (ACT), Scholastic Aptitude Test (SAT) exams, graduation rates, drop-out rates, course pass/fail rates, Grade Point Average (GPA), and a multitude of data elements already collected at either a state level or local level. This information may be valuable in the accountability and evaluation system.

  Additionally education professionals may collect data on a local level on students such as keeping track of students beyond graduation on an informal basis.

- **Collect local and state data to evaluate Career Cluster and Pathway Implementation and provide formal and informal reporting to stakeholders.**

  In addition to utilizing existing data to evaluate the Career Cluster and Pathway framework, some data elements may be missing and the evaluation and accountability system should develop a plan to identify and collect the data. Identification of the type of data needed and the source of the data will guide reporting and decision making around the Career Cluster and Pathway framework.
### Accountability and Evaluation Systems

<table>
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<td><strong>2.</strong> Examine data already collected to determine if there is existing data collection and elements that can be used in the accountability and evaluation system of Career Pathway implementation.</td>
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<td><strong>3.</strong> Collect local and state data to evaluate Career Cluster and Pathway Implementation and provide formal and informal reporting to stakeholders.</td>
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<td><strong>4.</strong> Utilize data to inform and implement change.</td>
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Course Sequences

Course sequencing is an important part of a program of study. Students gather valuable knowledge and skills from course content, building higher level skills as they progress through advanced level courses. The Program of Study must include both the secondary and postsecondary coursework and experiences. The emphasis in a specific career pathway must be on one or more of the following: high-wage, high-demand, and/or high-skill jobs.

Non-duplicative sequences of secondary and postsecondary courses within a Program of Study ensure that students transition to postsecondary education without replicating classes or requiring remedial coursework. Furthermore, by planning a secondary and postsecondary sequence of courses within a Career Pathway, students can maximize opportunities for course articulation.

Steps

- **Map out the required and recommended academic and career and technical courses and/or other work-based learning opportunities and educational experiences in each Career Pathway.**

  The process for mapping out required and recommended academic and CTE courses is as follows:
  
  - Identify relevant national, state, and industry standards
  - Align standards to existing courses and/or update courses as needed
  - Go to the MUS Big Sky Pathways web site to access an online Program of Study template
  - Insert the required secondary courses into the template
  - Design a course path from grade 9 to degree or certificate and beyond, including career-related courses
  - Sort the required courses into technical core and technical specialty
  - Add recommended opportunities for work-based learning, internship, Career and Technical Student Organizations (CTSO) participation, volunteering, etc.
  - Complete the template by recommending electives that enhance the pathway experience.
  - Insert the required and elective postsecondary courses into the template

- **Begin with introductory courses at the secondary level that teach broad foundational knowledge and skills that are common across all Career Pathways.**

  The secondary component must include these essential elements:
  
  - Meets state academic standards and grade-level expectations
  - Meets high school graduation requirements
• Meets postsecondary entry/placement requirements
• Provides foundation knowledge and skills in chosen clusters
• Provides opportunities for students to earn college credit through dual/concurrent enrollment or articulation agreements

In secondary career pathway courses, students should engage in academic learning, participate in career experiences, and develop basic work skills.

➤ **Progress to more specific courses at the secondary level providing knowledge and skills required for entry and advancement in a chosen Career Pathway.**

As students’ progress through the Career Pathway, more technical skills are developed, they engage in more challenging academics, and work-based learning experiences begin to occur.

The secondary component of the Career Pathway must also define curriculum content (what is taught) and include:

- Technical, academic, and 21st century employability skills required by employers
- State-mandated curriculum standards and graduation requirements
- Entrance requirements of partnering postsecondary institutions (i.e., Compass, ACT, SAT, etc.)
- Alignment and articulation with postsecondary certificates, diplomas, associate’s degree programs and/or baccalaureate programs
- Opportunities for students to earn college credit through dual enrollment or high school for college credit
- Opportunities for students to earn industry-recognized credentials and certifications

➤ **Offer opportunities for students to earn postsecondary credit.**

Opportunities for high school students to get a head start on earning college credits while continuing to fulfill high school graduation requirements may be accomplished through Dual Enrollment or High School for College Credit (Appendix). Opportunities for Dual Enrollment and High School for College Credit should be incorporated into pathways and Programs of Study where appropriate.

➤ **Offer opportunities for students to earn industry-recognized credentials and certifications.**

Opportunities for high school students to learn employable, career-ready skills during high school are important. Programs of Study should include opportunities to earn industry recognized credentials and certifications while completing relevant coursework, along with internships and work-based learning experiences.

➤ **Progress to more career and occupationally-specific courses at the postsecondary level.**

In postsecondary courses, students develop advanced technical skills, advanced academic skills, and gain additional worksite experience.

The postsecondary component must include these essential elements:
• Additional opportunities for students to earn industry-recognized credentials and certifications, and take advantage of work-based learning and internships
• Alignment and articulation with baccalaureate programs (transfer opportunities)
• Industry-recognized skills and knowledge in each cluster area

➤ Focus on reducing or eliminating remediation.

Understanding the Career Pathway course transition between high school and college requires conversations between secondary and postsecondary teachers and staff to:

• Discuss threshold program content expectations,
• Identify areas of content gaps/overlap,
• Understand academic and technical performance expectations for the first year of postsecondary study,
• Identify pre-requisites colleges may require for individual programs and courses, and
• Identify new assessments, course offerings or other ideas for smoothing and accelerating students’ progress on their Programs of Study.

As part of these discussions, postsecondary institutions often have data to identify areas of high incoming student remediation. Data is also often available on incoming high school students’ remediation rates sorted by their college program choices. Basic data such as this is typically available for the state’s 2-year, community, and tribal colleges by college as well. The Institutional Researcher or Career Pathway representative can help you locate and navigate through this data as well as with other information that might be available. Contact information for Career Pathway coordinators can be found on the MUS Big Sky Pathways web page. Here is a sample agenda of a high school articulation meeting with a 2-year college:

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**High School Articulation Meeting**
High School - Postsecondary Agri-Science

Members present – High School Agri-Science Teachers, Postsecondary Agri-Science Faculty, Career/Tech Prep Coordinator, College Dean, Business and Industry Representatives

**Agenda**

• Dean/Lead faculty welcome
• Program updates—new programs, changes to existing programs, student enrollment data, graduate follow up highlights
• Career pathways update: review cluster model for specific content areas
• Industry updates: Advisory committee report, industry needs assessment
• Curriculum/competency alignment: existing courses available for articulation, discussion of college curriculum, skills needed for success
• Professional development opportunities: what is needed, best time to offer it

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Another method for gaining information to help ensure smooth course sequencing is to have teachers review in detail course materials for the subsequent course in the career pathway. In some cases a teacher could potentially assist with or audit the content of the next sequential course so that a better understanding of expectations of rigor and depth could be developed.
## Course Sequences

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<td>2. Ensure that introductory courses at the secondary level to teach broad foundational knowledge and skills that are common across all career pathways.</td>
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<td>3. Progress to more specific courses at the secondary level that provide knowledge and skills required for entry and advancement in a chosen career pathway.</td>
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<td>4. Offer opportunities for students to earn Dual and High School for College Credit.</td>
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<tr>
<td>5. Offer opportunities for students to earn industry-recognized credentials and certifications, internships &amp; work-based learning</td>
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<tr>
<td>6. Progress to more career and occupationally-specific courses at the postsecondary level</td>
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<tr>
<td>7. Focus on lowering remediation between secondary to postsecondary transfer</td>
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</table>
**High School for College Credit & Dual Enrollment**

*High School for College Credit* awards college credit for a course or series of high school courses, which may culminate in a state or nationally recognized exam. High school for college credit can be awarded through local articulation or through advanced placement.

**Local Articulation** refers to aligning high school and postsecondary curricula to create a sequence of courses offering skill attainment without unnecessary duplication. Articulation focuses on providing opportunities for high school students to take college-level course work in order to get a head start on earning college credits while continuing to fulfill high school graduation requirements. Formal articulation agreements must be in place in order for the credit to be valid.

Articulation agreements are formal agreements created between public school districts and postsecondary institutions. Students benefit from articulation as it helps them transition seamlessly from one institution to another and/or one level of education to another.

All Common Course Numbered courses ([http://mus.edu/Qtools/CCN/CCN.asp](http://mus.edu/Qtools/CCN/CCN.asp)) that are locally articulated will transfer within the Montana University System, functioning as a state-wide agreement.

**Advanced Placement** is administered by the College Board ([http://apcentral.collegeboard.com/home](http://apcentral.collegeboard.com/home)). Advanced placement courses provide students with challenging coursework in general education disciplines which meet college-level student learning outcomes. At the end of the course, the student takes a national examination. If the student achieves a score pre-determined by the college, he or she may (a) receive college credit for the course, (b) be granted advanced standing by the college, or (c) be allowed to waive the requirement for that course.

**Dual Enrollment** is a broad term for various types of opportunities for high school students to take college coursework and earn credit while still enrolled in high school. The two models for awarding dual credit in Montana are dual credit and college-credit only.

**A Dual Credit** course awards both high school credit and college credit for a college course taken by the high school student.

**A College-Credit-Only** course awards college credit, but not high school credit, for a college course taken by a high school student.
Montana’s University System promotes and supports high school to college transitions and dual enrollment for career and technical education students. More information on High School for College Credit can be found on the MUS website under Big Sky Pathways. Dual Enrollment Guidelines can be found on the MUS website under Dual Enrollment.

Steps

Provide a systematic, seamless process for students to earn dual and high school for college credit
The goal of dual enrollment and local articulation agreements is to create opportunities for students to earn and transfer high school credit to Montana’s two- and four-year institutions which offer the students’ particular Program of Study.

Because a Program of Study must include both secondary and postsecondary course sequences, it is not complete until all possibilities for dual enrollment and articulation are reviewed or created and incorporated into the program of study by the Career Pathway team.

Opportunities for Dual Enrollment and Articulation agreements from high school to two-year colleges, programs, and universities should be listed on institution websites.

Note the college credit earned.
When students earn college credit through dual enrollment, advanced placement or through local articulation, the credit should be noted either on the high school transcript (which should be requested by the community college) or directly on the college transcript. Making certain the credits appear on the student’s transcript facilitates a seamless transfer into the postsecondary portion of the program of study without the need for additional paperwork or petitioning for credit.

Describe expectations and requirements
Dual enrollment Operating Agreements must follow the administrative procedures outlined in the Montana University System Dual Enrollment Guidelines (Section H). Local Articulation Agreements must, at a minimum, clearly detail teacher and faculty certifications/qualifications, if there is an agreement about which teacher(s)/instructor(s) from a particular school/institution will teach the articulated course or sequence of courses. The agreement must also clearly indicate course prerequisites, postsecondary entry requirements, location of courses, tuition reimbursement, and credit transfer process so students, parents, and secondary and postsecondary partners have a clear understanding of how the articulation process works and to be certain the student gets credit for articulated courses completed as part of a program of study.
High School for College Credit

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<tbody>
<tr>
<td>1. Provide a systematic, seamless process for students to earn dual or high school for college credit.</td>
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<tr>
<td>2. Credits earned are noted on the high school transcript or students are issues a transcript from the accepting college</td>
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<tr>
<td>3. An operating agreement or local articulation agreement is present (NA for Advanced Placement)</td>
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School Counseling and Academic Advising

Secondary Counseling

Academic and career counseling is provided from pre-kindergarten through 12th grade in comprehensive school counseling programs and is provided in postsecondary advising programs. Academic, career counseling and advising helps students make informed decisions about which Career Pathway to pursue. Information regarding Montana’s School Counseling standards and practices can be found on the Montana School Counselor’s Association Website: http://www.mtschoolcounselor.org/MT_School_Counseling_Program_Model/Introduction.html.

Postsecondary Counseling

Postsecondary advisors assist students in educational program planning and course selections consistent with their career goals. Many postsecondary students enter college at different levels of readiness, and assistance in selecting a program of study and counseling in career direction and development is integral to their success. Depending on the size of the postsecondary institution and its staffing patterns, career development professionals, advisors, counselors, financial aid administrators, special services support staff and others may be involved in supporting students to select and persist in program of study choices.

Steps

- **Ensure school counselors have access to up-to-date information about Career Pathway offerings.** Successful implementation of Career Pathways in a school district requires a team approach. A team, consisting of school counselor(s), core academic teachers, CTE teachers, a CTE coordinator, a curriculum specialist, business and industry representatives, postsecondary partners, and legislators spearheads the development and implementation of quality Program of Study, and assists with ongoing revisions to them. Partnerships between secondary and postsecondary school counselors and academic advisors enable effective Programs of Study to be built. Once Career Pathway information is disseminated to parents, students, and other stakeholders, school counselors and teachers work together with individual students to assist in career and interest exploration and decision making.

- **Offer information and tools to help students learn about postsecondary education and career options.** Teachers and school counselors must be aware of postsecondary and career options including prerequisites for a selected program of study. Because it is nearly impossible for every student to be aware of every possible postsecondary program option and career within a given Career Pathway,
teachers and school counselors need to know where to direct students for such information. The Montana Big Sky Pathway website at [http://mus.edu/BigSkyPathways/default.asp](http://mus.edu/BigSkyPathways/default.asp) is a resource where professional educators can locate information on programs of study and CTE options for specific Pathways at postsecondary institutions. Counselors can find specific resources at: [http://mus.edu/BigSkyPathways/CareerCounseling.asp](http://mus.edu/BigSkyPathways/CareerCounseling.asp). Additional web resources are also noted throughout the guide.

- **Offer resources for students to identify career interests and aptitudes and to select an appropriate Career Pathway.**
  
  In the secondary setting, teachers and school counselors may provide opportunities for students to take career interest and learning style inventories beginning in 4th grade and continuing through high school with benchmarks at 8th and 12th grade. Because it is optimal for students to base their career plans on a variety of career awareness and exploration experiences, inventories that assess work values, learning styles, career interests and aptitudes, etc., are explored as part of career classes and are incorporated into Career Pathway courses. Several inventories have been written for students at the elementary level. School counselors and teachers will want to be knowledgeable about the inventory, its development, and its validation so they can speak accurately to parents and students about what the results indicate. In this way, school counselors and teachers can assist students and their parents to interpret inventory results and compare the results from multiple assessments to determine which Career Pathway is right for them. Career Pathway interest can change as the student explores more avenues for their future.

- **Provide information and resources for parents.**
  
  Parents are an integral component of academic and career planning. They are not only their children’s first career development role models, they also want what is best for their children and may strongly influence course selection, postsecondary, and career decisions. Therefore, it is ideal for parents to be involved in the career exploration and development processes that their children experience. Because parents may have limited viewpoints about postsecondary and career options based on their personal experiences, the school counselor’s goal is to communicate about the options available on a regular basis. Providing parents with credible resources and information will help them to assist their students to make informed career planning decisions.

- **Offer web-based resources and tools for obtaining student financial assistance.**
  
  Once a student selects a Career Pathway, the student and his or her parents will be interested in information about financing the postsecondary choices. Educators can provide access to this information. They can also direct students and parents to other experts who can help students learn more about financial assistance and how to apply for it. Visit Montana’s Prepare and Pay to learn more: [http://mus.edu/Prepare/default.asp](http://mus.edu/Prepare/default.asp).
School Counseling and Academic Advising

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Technical Skill Attainment

National, state, and/or local assessments provide ongoing information on the extent to which students are attaining the necessary knowledge and skills for entry into and advancement in postsecondary education and careers in their chosen Career Pathways.

Assessments vary by the target skill being assessed including:
- Technical skill assessment
- Academic skill assessment
- Employability skill assessment (21st century skills)

Assessments occur at a variety of points along the secondary to postsecondary path, depending on the assessment. Usually postsecondary education focuses on technical skills and employability skill assessments. These assessments are usually very specific to a specific industry, such as tests in nursing, welding or dental hygiene. Secondary education tests focus primarily on academic and employability skills. They do, however, does incorporate some technical skill assessments.

Career Pathways must include the acquired technical, employability, and academic skill attainments throughout the journey of a program of study. Career Pathways include and ultimately lead to required licensure, industry-recognized credential or other recommended attainment for the occupations within the Pathway, thus aligning secondary and postsecondary Pathways with educational and work requirements. The assessment process is often built within educational programs ensuring students are acquiring technical, academic and employability skills. Skill assessments can be traditional paper/pencil tests, but may also be other types of formal and informal evaluation. For example, a teacher or business/industry expert may complete a rubric or checklist consisting of skills and competencies based...
on observation of a student completing a performance task or process. Also, a rubric or checklist may be used to assess cumulative skills students used to create a capstone or end-product.

Skill assessments may include employability skill certificates; state certified co-ops, WorkKeys, or a variety of specific occupational skill attainment measures such as Automotive Service Excellence (ASE) or National Council Licensure Examination (NCLEX) or other certifications. Academic skill attainment is often measured in nationally standardized tests like Compass, TABE, ACT, SAT or state standardized tests.

At the secondary level, measures of skill attainment are incorporated at appropriate places in the Pathway, demonstrating the student is ready for college or a career.

Skill assessments ensure the student is ready to enter and succeed in postsecondary educational programs or employment. Technical-, academic-, and employability skill attainment measures technical skill proficiencies, employs state-developed/approved assessments, and/or industry-approved assessments. Performance-based assessment items are incorporated to the greatest extent possible so students are allowed opportunities to demonstrate application of their knowledge and skills. National or state skill standards are incorporated throughout the program of study curriculum.

Examples of secondary skill attainment measures may include employability skills certificates, academic skill measures including ACT or SAT examinations, and technical skill assessments such as a state certified co-op completion. The type of skill attainment that is most appropriate should be determined by the Career Pathway team, where multiple stakeholders are involved and effectively access its effectiveness.

At the postsecondary level, measures of skill attainment are incorporated at appropriate places in the Pathway, demonstrating the student is ready for an occupation.

Skill assessments ensure the student is ready to enter and succeed in a career. Technical-skill, academic-skill and employability-skill attainment measures technical-skill proficiencies, employs state-developed/approved assessments and/or industry-approved assessments. Performance-based assessment items are incorporated to the greatest extent possible so students are allowed opportunities to demonstrate application of their knowledge and skills. National or state skill standards are incorporated throughout the program of study curriculum.

Postsecondary-skill assessments include employability certificates such as WorkKeys and technical-skill assessments specific to the occupation such as regulation and licensure, apprenticeship completion, ASE, NCLEX, and other occupational specific credentials and licenses.

A Student’s Formal Skill Attainment Journey for Health Science

**High School**
- Compass Assessment
- Obtain Certified Nursing Assistant (CNA) Certificate
- WorkKeys assessment/certification

**Postsecondary**
- WorkKeys assessment/certification
- National Council Licensure Examination (NCLEX)
Montana Big Sky Pathway Implementation Guide
Part III: Implementing a Big Sky Pathway

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Policies & Procedures

This section addresses how federal, state, and local policies and procedures may support and promote the development and implementation of a Program of Study. Policy efforts that focus on rigorous academic and technical courses, community and employer participation, school counseling, career development, transcripted credit, education for employment, high school graduation requirements, vertical and horizontal curriculum alignment, articulation agreements, career and college readiness, evaluation and accountability, professional development, and partnerships are essential to advance Career Clusters and Pathways within Montana school districts.

Steps

➢ Review and revise existing school/district and postsecondary institutional policies and examine procedures to determine the impact on Career Cluster and Pathway implementation.

Existing policies and procedures are a good starting point to determine if policies and procedures promote or conflict with Career Pathway implementation. State-level policies include, but are not limited to:

→ the State Perkins plan (http://mus.edu/Perkins/SPCurrentVersion.pdf)
→ the credit for prior learning at the MUS (http://mus.edu/2yr/DualEnrollment.asp)
→ grant guidelines and application materials (http://mus.edu/Perkins/Program%20Docs/Perkins%20Local%20App%20Guide%202014-2015_Final.pdf for OCHE and http://opi.mt.gov/programs/CTAE/CTE.html#gpm1_1 for OPI)

The school/district may already have policies established. Examples of local policies or procedures which may include, but are not limited to:

→ the mission and vision of CTE programs
→ procedures for informing students of career pathways
→ career development policies and practices
→ work-based learning opportunities

A conversation with a local CTE Coordinator and a postsecondary Career Pathways Coordinator may be beneficial. A listing of the Career Pathway Coordinators and contact information is available at http://mus.edu/BigSkyPathways/resources.asp.
Determine and ensure education professionals, students, and community stakeholders are aware of policies and procedures supporting Career Cluster and Pathway implementation. First and foremost all stakeholders involved in this process should be aware and working within the existing or newly developed policy and procedures supporting program of study implementation. This may involve a school/district/postsecondary institution evaluating stakeholders on knowledge and application of the policies and procedures. Understanding the state Perkins plan and reviewing the Perkins Local Grant Application are two examples of policy knowledge for application to Career Pathways. See the professional development component for further information on educating stakeholders about the Career Cluster and Pathway implementation.

Provide for sufficient funding and other resources for Career Cluster and Pathway Implementation. Time and again, education professionals are enthusiastic about developing Career Clusters and Pathways and implementing a Career Cluster and Pathway framework, however, their passion to get things done is stifled by limitations and challenges presented in their schools/districts. Administrators need to dispel attitudes such as “what is the minimum we have to do to be in compliance with Perkins IV?” Instead, administrators need to be champions for fully implementing a Career Cluster and Pathway framework for the benefit of students, education professionals, the community, business/industry, and the local or regional economy. Administrators also need to support and appoint leaders to Career Cluster and Pathway teams who will serve as the innovators and champions within the school/district, serving as positive examples for others to follow.

Ongoing studies are being conducted to determine the needs of education professional to take Career Clusters and Pathways to the next level of deeper and meaningful implementation. The overwhelming response is the question, “what do you need?” is “time to do the work” and “resources to support the work.” Funding is needed to support professional development (see Professional Development) and staff members need to be allowed dedicated time blocks to meet as a Career Cluster and Pathway teams with stakeholders and partners to develop and update curriculum, connect with partners, develop, review and update articulation agreements, and the list goes on. Sometimes support staff is needed to assist with research; data collection and reporting, written documentation, web site development, and other Career Cluster and Pathway framework related activities. In this Guidebook, a more detailed overview of the work to be done by education professionals is provided. Education professionals cannot succeed without administrator and administrative support.

Schools, districts, and postsecondary institutions may not have all the resources they need to implement Career Cluster and Pathway framework well. Tough decisions need to be made each year regarding allocation of existing resources, how existing resources can be reallocated to this purpose; and how partners and stakeholders may be able to leverage additional resources for the task.

Establish formal procedures for the needs assessment, design, implementation, and continuous improvement of Career Pathways. Education professionals from both secondary and postsecondary should work as a team with other education, business and industry, legislative, workforce and economic development partners to conduct needs assessments relating to workforce and labor market information (see the Partnership Component). Using the results of the needs assessment, the team should determine which career
pathway(s) needs to be developed in the school district. It is beneficial if the school/district has a uniform process for accomplishing this task to assist newly formed Career Cluster and Pathway teams, and is guided by the processes and procedures in place. Once a Career Pathway has been designed, a lot of work must happen in the ensuing years to update curriculum, create and revise articulation agreements, establish and maintain partnerships, evaluate student and stakeholder experiences, and further lay the foundation for successful Career Cluster and Pathway framework implementation and continuous improvement.

- **Ensure opportunities and support for any student to participate and succeed in a Career Pathway.** Not only should administrators be concerned with support for education professionals and stakeholders involved in Career Cluster and Pathway teams, they need to make sure every student in the school/district has an equal opportunity to participate and be successful in completing a program of study. First, Career Cluster and Pathway framework options must be widely distributed through school and district publications and communications such as the course catalog, student handbook, school/district website, etc. Resources are needed so all students can use a web-based career guidance system such as Montana Career Information System (MCIS) or Career Cruising, e-portfolios, and other career development software/materials in their classes.

- **Provide resources for long term sustainability of Career Cluster and Pathway frameworks.** It is important to understand full implementation of Career Cluster and Pathway framework may take several years to launch and then need to be reviewed and improved on a long-term basis. Just as school districts have policies and procedures for curriculum review and renewal, the Career Cluster and Pathway framework will also need a schedule of renewal.
## Policies and Procedures

<table>
<thead>
<tr>
<th>Policy</th>
<th>Needs To Be Considered</th>
<th>In the Planning Stage</th>
<th>Partially Implemented</th>
<th>Fully Implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Review and revise existing school/district and postsecondary institutional policies and examine procedures to determine the impact on Career Cluster/Pathway implementation.</td>
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<tr>
<td>2. Determine and ensure education professionals, students, and community stakeholders are aware of policies and procedures supporting Career Cluster/Pathway implementation.</td>
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<tr>
<td>3. Provide for sufficient funding and other resources for Career Cluster/Pathway implementation.</td>
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<tr>
<td>4. Establish formal procedures for the needs assessment, design, implementation, and continuous improvement of Career Pathways</td>
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<tr>
<td>5. Ensure opportunities and support for any student to participate and succeed in a Career Pathway.</td>
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</table>
Part III. Implementing a Big Sky Pathway (Program of Study)

Putting It All Together – 5 Phases

Big Sky Pathway implementation may start in a variety of settings—perhaps at a high school, a 2-year, community, or tribal college, industry-based organization, or even an economic development agency. Utilizing this document, the development and creation of a program of study can be successful regardless of where the program of Study implementation begins.

This section will outline five phases of the Program of Study Implementation process. Each phase will identify the relevant components of the OVAE National Model of Program of Study Implementation. Further, each phase will contain action steps across three levels of development a Program of Study requires. These levels are Developmental, Implementation and Refinement. There are five basic phases of work in implementing a program of study.

A. **Laying the Groundwork** - Researching best practices and collecting data about model programs of study based on local labor market information.

B. **Assembling a Team** - Gathering a representative group of all stakeholders who will work together to guide the creation of a Program of Study.

C. **Designing and Building a Program of Study** - After selecting a specific pathway, team members analyze curriculum and determine development and improvement needs. The outcome of this phase is a detailed plan for the implementation of the program of study.

D. **Implementing the Program of Study** - the detailed Program of Study plan is put in place; students enroll in the program and continue on to postsecondary education or career.

E. **Evaluating and refining the Program of Study** - An evaluation plan defining the data elements needed, how they will be collected, what the benchmarks for success are, and who is responsible for providing the improvements in the Program of Study is created. Considerations for refinement of the Program of Study are made after a strong evaluation.
Implementing a Big Sky Pathway requires groundwork and preparation prior to starting. Think of it as preparing the foundation to be set in the process of building a home. Who does this work will vary by school district and postsecondary institution and may include a variety of individuals including administrators, teachers, counselors, students, and everyone in-between. The critical partnerships created for a particular program of study will vary and must be identified for each one created.

Relevant components for this phase include the Policies and Procedures and Partnerships. Additionally, it is not too early to begin planning for Professional Development or the Accountability and Evaluation Systems necessary for measuring success.

**What Does Success Look Like for Laying the Groundwork?**

<table>
<thead>
<tr>
<th>Developmental Level</th>
<th>Needs To Be Considered</th>
<th>In the Planning Stage</th>
<th>Partially Implemented</th>
<th>Fully Implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Administrators and policy-makers are familiar with and support the Career Cluster and Pathway initiative.</td>
<td>✔️</td>
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<tr>
<td>2. Labor market and employer information is reviewed to identify potential Programs of Study.</td>
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<tr>
<td>3. An evaluation process is in place for the internal and external review of existing offerings and curriculum at both secondary and postsecondary institutions.</td>
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<td>4. Needs assessments are conducted to determine training and development needs of local and regional stakeholders.</td>
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<td>5. Needs assessments of student career interests and necessary technical skills are conducted and analyzed.</td>
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Montana Big Sky Pathway Implementation Guide
Part IV: Implementing a Big Sky Pathway

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<th>Implementation Level</th>
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<th>Partially Implemented</th>
<th>Fully Implemented</th>
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<tr>
<td>1. Potential critical partners are actively identified and solicited.</td>
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<td>2. Connections are built through School-to-Work, Perkins, Career and Technical Education or Education for Employment networks.</td>
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<td>3. Connections are built with non-education focused stakeholders like business and industry, Chambers of Commerce, Economic Development or other community-related organizations.</td>
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<td>4. Educators participate in networking meetings and seminars to stay up-to-date in the Career Pathway field and local economic development needs.</td>
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<td>5. Needs assessments conducted to determine the focus of Program of Study Professional Development.</td>
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<td>6. Network of communications about Program of Study are developed and utilized within and across partnerships and organizations.</td>
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<tr>
<th>Refinement Level</th>
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<th>In the Planning Stage</th>
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<tbody>
<tr>
<td>1. Budget requirements are identified for the first three phases of the Program of Study implementation process.</td>
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<td>2. Potential funding sources are identified for initial and long term Program of Study implementation.</td>
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<td>3. Existing and potential resources of secondary, postsecondary, and community organizations are identified and related to potential programs of study.</td>
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<td>4. Potential Programs of Study are included in the secondary Carl D. Perkins Act applications as soon as possible. Career/Tech Prep coordinators are informed of potential program of study as soon as possible.</td>
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<td>5. Partnerships are developed and evaluated to ensure growth and stability for program of study.</td>
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</tbody>
</table>
B. Assembling a Team

Designing and implementing a Big Sky Pathway requires collaboration at every level of the process. Based on your local community, a team should be convened that includes content and CTE teachers, curriculum and CTE coordinators, counselors, business and industry representatives, postsecondary partners and faculty, education administrators, labor union representatives, and recent graduates. This team will first examine policies and procedures currently operating in partner organizations to determine if they are in alignment with program of study implementation guidelines. This analysis will lead to the creation of relevant policies and procedures the school district or postsecondary institution may need to implement or alter.

The team has many planning responsibilities. The first is to examine regional and local labor market data and determine the highest employment needs in the local community and region. Labor market data for the State of Montana can be found at: http://www.ourfactsyourfuture.mt.gov/. This data will help determine the specific pathways and curriculum needed for this community. It is essential to look at both secondary and postsecondary connections to make sure that a relevant pathway is created for a seamless student transition. It is also important to look at other sources of information; including surveys of local employers identifying the skills needed in future employees. Are the connections in place to lead students in this Program of Study to high-skill, high-demand, or high-wage jobs?

Another responsibility of the team is to insure that secondary and postsecondary partners work together on the design, development and implementation of Programs of Study. Both secondary and postsecondary educators should view the Big Sky Pathways Coordinator at their local community college as their first point of contact in Program of Study development. Please refer to http://mus.edu/BigSkyPathways/resources.asp for a listing of the Big Sky Pathways Coordinators at Montana’s two-year college programs and community and tribal colleges in the State. Good questions to ask include, “How many students from the high school are going on to that college,” “How many students are prepared for college-level work, what programs they are completing, what are local articulated/ dual credit courses, and how many transfer on to a 4-year college?”

This team will continue the work throughout all five phases of this project. The team is integral in planning, implementing, and evaluating the Program of Study and should provide feedback for any necessary changes required. Leadership for this team is critical. It is important to identify team leaders
from both the secondary and postsecondary institutions and give them the time and resources they need to be successful.

What Does Success Look Like for Assembling a Team?

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<thead>
<tr>
<th>Developmental Level</th>
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<th>In the Planning Stage</th>
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<th>Fully Implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A team approach consisting of secondary school counselor(s), core academic teachers, CTE teachers, a College Pathway coordinator, business and industry representatives, college faculty, dean, and relevant community members is utilized.</td>
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<tr>
<td>2. Program of Study team members and stakeholders become knowledgeable about Career Clusters, Pathways, and regional program of study opportunities.</td>
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<td>3. Introductory professional development is researched, developed, and provided.</td>
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<tr>
<td>4. Team member roles and responsibilities are identified.</td>
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<thead>
<tr>
<th>Implementation Level</th>
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<th>In the Planning Stage</th>
<th>Partially Implemented</th>
<th>Fully Implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The program of study team reviews relevant secondary and postsecondary curriculum related to the Program of Study.</td>
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<tr>
<td>2. The program of study team needs to collaborate with any existing advisory committees and encourage the integration of resources.</td>
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<tr>
<td>3. Professional development opportunities for stakeholders are identified and shared.</td>
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<tr>
<td>4. Program of Study team members and stakeholders participate in professional development programs specific to each stage of pathway development.</td>
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<tr>
<td>5. Data on program of study development progress is collected and analyzed for quality, including how well it meets the needs of diverse students. Progress reports are created and shared with all stakeholders.</td>
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<tr>
<td>Refinement Level</td>
<td>Needs To Be Considered</td>
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<tr>
<td>1. There is evidence of regular, productive program of study team meetings and collaborative maturity.</td>
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<tr>
<td>2. Program of Study choices are evaluated to insure they correspond with analyzed labor market data and to ensure nondiscrimination and equity in program of study opportunities.</td>
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<tr>
<td>3. Labor market information and stakeholder input are used to expand, refine, and update the program of study in order to maintain or exceed industry standards.</td>
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</table>
C. Designing and Building a Program of Study

Designing and building a Program of Study in a specific Career Pathway goes way beyond filling in a chart with the names of existing coursework. This stage includes reviewing college and career readiness standards, skill attainment certifications, current and prospective articulation agreements, appropriate course sequencing, and accountability and evaluation systems.

The Program of Study team will first review the skills and knowledge required for entry into a specific occupational or college program as well as entry into work. It is critical that postsecondary educators and business stakeholders are included to clarify the knowledge and skill proficiencies a student needs to have mastered by the completion of a program of study.

Next, the Program of study team will review the knowledge and skill statements of each Career Pathway to assess the sequence from secondary to postsecondary of existing or potential courses. Coursework mapping is the tool designed to assess what is currently offered and compare it to curriculum aligned to college and career readiness standards to truly prepare students for a successful career and future learning. Sample or initial knowledge and skill statements can be found on http://www.careertech.org/ An example of the knowledge and skill cluster statement from the careertech.org website follows. There are cluster-level and pathway-level knowledge and skills competencies that should be used to crosswalk current offerings. These statements can also be vetted with local industry groups.
The program of study team will work with the knowledge and skill statements for the purpose of both vertical and horizontal curriculum alignment. **Horizontal alignment** refers to teaching certain knowledge and skills at the same grade levels that are relevant in related subject areas. This includes content from academic and CTE coursework. **Vertical alignment** builds upon pre-existing knowledge from one grade level to the next, transitioning from high school to postsecondary courses. This alignment will include determining where each specific knowledge and skill will be incorporated in the individual course sequence. The team next aligns the specific knowledge and skills with existing courses or develops and designs new courses and begins sequencing the courses.

In addition to the mapping of knowledge and skill statements and the sequencing of existing and new courses, the Program of Study team will also look for opportunities for dual and high school for college credit and business and industry recognized credentials and certifications that add value to a high school diploma and provide seamless student transition to the postsecondary portion of their program of study. Articulation and operation agreements will be revised, improved, or newly developed as called for in the program of study.

Another related task of the program of study team is to incorporate certifications or related credentials for technical skill attainment throughout the Program of Study, with input from their business partners.

Additional national standards to consult include relevant academic and Career and Technical Education content standards, industry-developed standards, teacher association standards, and 21st century skill standards. Additional information can be obtained through specific occupational DACUM conducted at the postsecondary level. The DACUM process starts with industry descriptions of knowledge and skills that an employee needs to be successful in a specific occupational area (http://www.dacum.org/).
Lastly, the team will design the accountability and evaluation plan to collect data for evaluating the program of study. Data is essential to determine success of the pathway. Data must be disaggregated and analyzed to provide information on how and to what proficiency level diverse groups of students are achieving the required competencies. Such data contains clues as to what parts of the program of study need to be strengthened. Data from secondary, postsecondary and employer stakeholders needs to be included in the overall evaluation and accountability plan.

**What Does Success Look Like at this Step?**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Knowledge and Skill Statements have been analyzed, verified, and/or modified if needed and mapped to existing or future courses.</td>
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<tr>
<td>2. Secondary and postsecondary curricula are aligned to national standards with industry and community objectives in mind in order to develop an appropriate sequence of courses.</td>
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<tr>
<td>3. Required academic, technical, and employability skills are mapped throughout the program of study curriculum.</td>
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<tr>
<td>4. Data is analyzed according to demographic groups of students participating in the program of study to determine the size, scope, and possible supports or interventions needed to close any gaps.</td>
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<tr>
<td>5. A 3-5 year plan is used to guide decisions regarding course offerings and program of study development, implementation, and refinement.</td>
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<tr>
<th>Implementation Level</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Stakeholders verify the planned courses in the program of study represent a coherent and rigorous sequence.</td>
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<tr>
<td>2. Both secondary and postsecondary courses are included.</td>
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<tr>
<td>3. The district processes for curriculum development are being followed at both secondary and postsecondary levels.</td>
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<tr>
<td>4. Curriculum is written with content objectives, state/ national standards,</td>
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assessments, learning strategies, and evaluation strategies.

5. The program of study design requires innovative teaching and learning methods that integrate the use of technology, inquiry, challenge, and problem-based approaches, higher-order thinking skills, and competency based learning.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1. Dual Enrollment and High School for College Credit is developed or enhanced</td>
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<tr>
<td>2. Evaluation systems are designed to insure that courses represent a sequence of instruction that leads to a degree, certificate, or credential.</td>
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<tr>
<td>3. Evaluation systems are designed to insure that course and pathway outcomes are equitable based on sex, race, disability, English Language Learner status, economic status and other special populations as defined by the Perkins law.</td>
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<tr>
<td>4. The Program of Study is built and located online at the Big Sky Pathways website or is available to all stakeholders. (forthcoming)</td>
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<tr>
<td>5. A 3-5 year implementation plan has been developed and contains goals, timelines, and tasks to be performed related to the Ten Components of the Career Pathway.</td>
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<tr>
<th>Refinement Level</th>
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<th>In the Planning Stage</th>
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<th>Fully Implemented</th>
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<tbody>
<tr>
<td>1. Pathway curriculum is aligned with the current state standards for content and counseling.</td>
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<tr>
<td>2. Students and parents have opportunity for input into the development of the Program of Study.</td>
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<tr>
<td>3. Current Montana exams and other student assessment data are analyzed and used to make curriculum improvements for all students and for sub-groups of students.</td>
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<td>4. Articulation agreements are developed and updated on an annual basis and are shared with stakeholders.</td>
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<tr>
<td>5. The program of study team works with industry to identify the value added certifications required for occupations.</td>
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<tr>
<td>6. Schools, the community and employers provide relevant work-based learning opportunities and internships for students.</td>
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<tr>
<td>7. Professional development opportunities are provided to support educator’s use of innovative teaching and learning methods.</td>
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</table>
D. Implementing the Program of Study

Once a Program of Study is designed by the team and verified by all stakeholders, the next step is implementing or engaging students in the Program of Study. The components of School Counseling and Academic Advising, Teaching and Learning, and continued Professional Development are the focus of this phase. The work of the other components may appear at any time in the implementation phase, but these three components are critical to link the developed programs of study to the students who will utilize them.

From a student’s point of view, the Program of Study is the focus each individual student’s academic plan that will guide them throughout their educational career. Ideally, each student will create an academic plan before leaving middle school and review and update it yearly throughout high school. A student’s academic plan should be a fluid, living, breathing, mapped educational plan reflecting a student’s unique set of interests, needs, learning goals, and graduation requirements. It goes beyond the “four-year plan” used for many years in high schools and should document the student’s connections to the larger community, including examples of community service and volunteerism; membership in civic or community organizations; participation in leadership activities outside of school; involvement in job shadowing, mentorships, and/or apprenticeships; and the pursuit of skill development through hobbies, athletics, and fine arts.

Teaching and Learning reform and research has provided recommendations for the kind of instructional methods and practices as well as the organization of content that leads to higher student achievement. Research suggests that the teacher and their instructional skills are the most important factors in student achievement. Information on Montana education, teacher, curriculum and professional development can be found at the following link: http://opi.mt.gov/curriculum/. The following links will show numerous instructional strategies that any teacher may find useful to incorporate into their classrooms.

Professional development is also critical to the success of the educator. http://www.marzanoresearch.com/site/# (Click on Professional Development)

http://www.montanaacte.org/
### What Does Success Look Like at this Step?

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<tr>
<th>Developmental Level</th>
<th>Needs To Be Considered</th>
<th>In the Planning Stage</th>
<th>Partially Implemented</th>
<th>Fully Implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Classroom curriculum, instruction, and assessments are aligned with each other and meet the goals designed by the program of study team.</td>
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<tr>
<td>2. Teachers know about and actively participate in professional development to incorporate innovative teaching and learning strategies.</td>
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<tr>
<td>3. School counselors are familiar with the program of study framework and can locate and utilize information on each of the 16 Career Clusters and 79 Career Pathways.</td>
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<tr>
<td>4. Counselors and teachers provide students with career awareness, career interest assessments, and traditional and nontraditional career exploration opportunities and facilitate student career development growth.</td>
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<tr>
<td>5. The school district will work with local employers and community members to insure that students have opportunities to participate in work based learning.</td>
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<tr>
<td>6. Course description booklets include information on Career Clusters, Career pathways, and Programs of Study and identify how courses and course sequencing are related.</td>
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</tbody>
</table>

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>1. School counselors are familiar with, support, and promote the school’s Programs of Study and actively contribute to the work of the program of study team.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2. Teachers evaluate course and program of study data and use the information to improve student achievement or the operation of the program of study.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3. Teachers demonstrate a commitment to their ongoing learning through highly effective professional development.</td>
<td></td>
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</tr>
</tbody>
</table>
### Implementation Level

<table>
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<tbody>
<tr>
<td>4. Teachers encourage student feedback to provide input to their education and help make necessary improvements.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Teachers are familiar with common core content and proficiency standards as well as ever changing technical content related to the Program of Study.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6. Students are engaged in the learning process and show evidence of growth throughout their program of study. Diverse groups of students have substantially equal outcomes from the courses and activities in a program of study.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Students and parents are informed about labor market information, high demand/high wage careers, and multiple educational pathways to prepare for those careers.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Students are exposed to a variety of field trips, guest presenters, and mentors related to careers. Presenters represent the gender, ethnic, cultural, disability, and other diversity of the community.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>9. Technical Skill Assessments such as Employability Skills Certificates and other skill certificates (industry-based) are earned by students. Copies of the certificates earned are retained as evidence of success of the program of study.</td>
<td></td>
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</tbody>
</table>

### Refinement Level

<table>
<thead>
<tr>
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<th>In the Planning Stage</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Interest, skill, and aptitude inventories and assessments are available to students. Care is taken to overcome stereotypes and myths about careers appropriateness based on gender, ethnicity, disability, or other diversity factors.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2. Teachers and community members help students expand their interest, understanding, and awareness about careers.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3. Students can identify at least one career cluster or related pathways they are interested in</td>
<td></td>
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</tbody>
</table>
pursuing. They can also show the connection of those pathways to their current learning.

4. Students demonstrate growth toward and mastery of Program of study knowledge and skills.

5. Achievement gaps based on sex, ethnicity, disability, or other diversity factors are analyzed and steps are taken to close those gaps.

6. Student employability and 21st century skills are assessed at various levels so improvement in skills can be documented.

7. Students use the internet, e-portfolios, and/or career development software/materials in classroom lessons and advisement sessions to fulfill the goals of their program of study.

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Students participate in documented work experiences, youth apprenticeship, job shadowing, and volunteer experiences related to their Program of Study.</td>
<td></td>
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</tr>
<tr>
<td>2. Students participate in career fairs, career days, and other events hosted by universities, technical colleges, and other partners.</td>
<td></td>
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</tr>
<tr>
<td>3. Students and parents are provided career development resources and strategies.</td>
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</tr>
<tr>
<td>4. Secondary and postsecondary educators review the data on non-traditional course or program participation and completion</td>
<td></td>
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<tr>
<td>5. Review the number of student earned certifications is evaluated to determine improvements or enhancements for the refinement of the program of study.</td>
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<tr>
<td>6. Diverse and representative guest speakers are invited to present to students on work readiness skills and/or specific occupations.</td>
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<tr>
<td>7. Secondary schools prepare students for postsecondary education without the need for academic remediation in each program of study.</td>
<td></td>
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<tr>
<td>8. Students are prepared to enter into the workforce, prepared with 21st century and technical skills key to successful employment.</td>
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</tbody>
</table>
E. Evaluating the Program of Study

The last phase in implementation is developing and implementing a detailed plan for evaluation and accountability. Through each of the phases, the Program of Study team has made design decisions and draft data collection plans that will require both formative and summative evaluation.

Formative is an assessment of efforts prior to their completion for the purpose of improving efforts. The aim of this evaluation is prospective—to improve, to understand strengths, in order to replicate them or to isolate weaknesses in order to redesign them. Formative evaluations are done after specific events or points in time to get data about what happened. Answers to questions like, “What were the results?”, and “What impact on the Program of Study or participants can then be documented for future analysis?”

There are four main goals for formative evaluation:

- Planning—clarifies and assesses program of study plans
- Implementation—focuses on the extent to which a program is proceeding according to plan
- Progress—assesses a program of study programs progress from design to full implementation usually involves benchmarks that are assessed along the way
- Monitoring—is often conducted by an outside (impartial) evaluator for the purpose of overall program of study evaluation.

Summative Evaluation assesses program outcomes or impacts. Summative evaluation is retrospective—to assess concrete achievement. A summative evaluation could occur quarterly, twice a year, or at the end of the implementation phase.

At this point, the team refines and finalizes an evaluation and accountability plan. Such a plan defines:

- the data elements to be collected
- a timeline for each evaluation activity
- the individuals responsible for collecting/analyzing the data, and
- checkpoints where the program of study team will review and reflect on the data.

Evaluation and accountability results will be shared with partners. The partners and the program of study Team will decide based on the data what changes or improvements are needed in the design and
implementation of the program of study. Finally, professional development opportunities based on the data will be provided to all stakeholders so that planned refinements can be supported.

**What Does Success Look Like at this Step?**

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<tbody>
<tr>
<td>1. Program of Study formative and summative evaluation plan is developed and refined on a regular basis and will include short and long term local school, district, department, and individual performance goals and priorities.</td>
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<tr>
<td>2. The accountability/assessment plan addresses the core indicators of Perkins IV legislation.</td>
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<tr>
<td>3. Data collection systems are established or coordinated to provide data needed for formative and summative evaluations.</td>
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<tr>
<td>4. All data is analyzed in both the aggregate and disaggregate.</td>
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<tr>
<td>5. Using the evaluation charts in this manual, accountability takes place to evaluate the program of study and measures are identified with a plan to benchmark and report the outcomes from the data. Any performance or achievement gaps based on diverse characteristics are identified and addressed to eliminate the gaps.</td>
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</thead>
<tbody>
<tr>
<td>1. Disaggregated data on participants in high school enrollment, dual/ transcripted credit, youth options, and postsecondary programs is collected and analyzed.</td>
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<tr>
<td>2. Data on utilization of articulation agreements, including and the number and type of participants of secondary and/or postsecondary articulation agreements is collected, reported and analyzed.</td>
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<tr>
<td>3. Follow-up data is collected on diverse Career Pathway completers and high school graduates (i.e., postsecondary education</td>
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### Implementation Level

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</table>
| 1. Professional development is based on the findings of the evaluations and includes measurable improvements for one or more of the following:  
  - new instructional methods/strategies,  
  - differentiated instruction,  
  - introduced a new course,  
  - implemented a new course,  
  - major revamping of units, and/or  
  - new assessments/ rubrics added to units, student achievement and success, etc. | | | |
<p>| 2. The school, district, and program of study team keep track of enrollment and course grades, course passage rates, ACT/SAT scores, postsecondary placement assessments, etc., by student demographic economic status, gender, ethnicity, disability, special population status, etc.) and program categories. (AP students, Career Pathways completers, CTE concentrators, etc.) over time. | | | |
| 3. Data on participants of co-curricular and experiential learning opportunities (i.e., School-to-Work participants, students completing an internship or co-op experience, CTSOs, etc.) is collected and analyzed, including by demographic status. | | | |
| 4. Action steps are identified to address the goals and priorities and progress toward completion of the action steps is monitored by the accountability/evaluation team as well as the career pathways team. | | | |
| 5. Develop specific student competencies for each program of study and utilize them. | | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1. Evaluation instruments and data collection systems are functioning to track program of study measurable outcomes in all of the following:</td>
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<tr>
<td>• new instructional methods/strategies</td>
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<tr>
<td>• differentiated instruction</td>
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<tr>
<td>• introduced a new course</td>
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<tr>
<td>• implemented a new course</td>
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<tr>
<td>• major revamping of units, and/or new assessments/ rubrics added to units, student achievement and success, etc.</td>
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<tr>
<td>2. The program of study implementation team is actively reviewing and updating the program of study on a regular basis as a result of the evaluations.</td>
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<tr>
<td>3. The school, district, and program of study team keep track of both secondary and postsecondary graduation rates over time to determine effectiveness of the program of study delivery.</td>
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<tr>
<td>4. Enrollment, course grades, course pass rates, exam pass rates, graduation rates, etc., are reported and analyzed</td>
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<tr>
<td>5. Data on who earns state and/or national certification exams is collected and analyzed, including by demographic status.</td>
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<tr>
<td>6. Feedback on data is solicited from stakeholder groups and documented.</td>
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<tr>
<td>7. Program of study, CTE programs, and curriculum are updated and revised based on data-driven observations, including different performance or success based on demographics, recommendations, and decisions from various stakeholder groups.</td>
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<tr>
<td>8. Revisions are made to the program of study documents as courses are added or deleted from the middle school/high school/ college offerings.</td>
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</tbody>
</table>
9. The program of study team analyzes the pathway budget to determine current and future expenditures as well as cost effectiveness.

10. Increased student achievement is documented based on the data from one or more of the following: number of articulation agreements, student participation in CTSOs, participation in leadership activities, skills certificates completed, and participation in work-based learning options.
Part IV. Appendix

The appendix portion of the guide includes many helpful materials for Pathway and Program of Study implementation. From data to support the process, to key terms, helpful web links, and resources, this portion of the guide will grow with each passing year. If you have helpful materials that you would like to share and include in the guide, please send them to kwicks@montana.edu.
Web Resources

- Big Sky Pathways Resources: http://mus.edu/BigSkyPathways/resources.asp
- Certified Regional Development Corporation Regions: http://businessresources.mt.gov/CRDC/crdcmap.mcpx
- Common Course Numbering: http://mus.edu/Qtools/CCN/CCN.asp
- College Board: http://apcentral.collegeboard.com/home
- CTE: Learning that Works For America: www.CareerTech.org
- DACUM: http://www.dacum.org/
- Governor’s State Workforce Investment Board of Montana: http://swib.mt.gov/
- Montana ACTE: http://www.montanaacte.org/
- MUS Big Sky Pathways Website: http://mus.edu/BigSkyPathways/default.asp
- MUS Data & Reports: http://mus.edu/data/dataindex.asp
- MUS Dual Enrollment Guidelines: http://mus.edu/2yr/DualEnrollment.asp
- MUS High School for College Credit Guidelines: http://mus.edu/BigSkyPathways/resources.asp
- MUS Prepare & Pay: http://mus.edu/Prepare/default.asp.
- OPI CTE Website: http://opi.mt.gov/programs/CTAE/CTE.html
- OPI CTE Data Collection: http://opi.mt.gov/programs/CTAE/CTE.html#gpm1_6
OPI Specialist Career Cluster Contact Sheet

POC: Brad King
Phone: 444-4451
E-mail: bking2@mt.gov

POC: Megan Vincent
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E-mail: eswenson@mt.gov

POC: Don Michalsky
Phone: 444-4452
E-mail: dmichalsky@mt.gov
## Career and College Pathway Coordinators

<table>
<thead>
<tr>
<th>Post-Secondary College</th>
<th>Big Sky Pathways Contact Name</th>
<th>Address</th>
<th>Phone Number</th>
<th>E-Mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackfeet Community College</td>
<td>Brad Hall</td>
<td>504 SE Boundary Street</td>
<td>406-338-5441 X2239</td>
<td><a href="mailto:brad@bfcc.edu">brad@bfcc.edu</a></td>
</tr>
<tr>
<td>Bitterroot College U of M</td>
<td>Roch Turner</td>
<td>274 Old Corvallis Road, Suite C Hamilton, MT 59840</td>
<td>406-375-0100</td>
<td><a href="mailto:Roch.turner@umontana.edu">Roch.turner@umontana.edu</a></td>
</tr>
<tr>
<td>City College</td>
<td>Ben Barckholtz</td>
<td>1500 University Drive Billings, MT 59101</td>
<td>406-657-1714</td>
<td><a href="mailto:benjamin.barckholtz@mubillings.edu">benjamin.barckholtz@mubillings.edu</a></td>
</tr>
<tr>
<td>Dawson Community College</td>
<td>Suela Cela</td>
<td>300 College Dr. Glendive, MT 59330</td>
<td>406-377-9419</td>
<td><a href="mailto:scela@dawson.edu">scela@dawson.edu</a></td>
</tr>
<tr>
<td>Flathead Valley Community College</td>
<td>Beth Romain</td>
<td>777 Grandview Drive Kalispell, MT 59901</td>
<td>406-756-3923</td>
<td><a href="mailto:eromain@fvcc.edu">eromain@fvcc.edu</a></td>
</tr>
<tr>
<td>Fort Peck Community College</td>
<td>Judy Ogle</td>
<td>P.O. Box 398 Poplar, MT 59255</td>
<td>406-768-6347</td>
<td><a href="mailto:jogle@fpcc.edu">jogle@fpcc.edu</a></td>
</tr>
<tr>
<td>Gallatin College</td>
<td>Amy Williams</td>
<td>101 Hamilton Hall P.O. Box 170515 Bozeman, MT 59717</td>
<td>406-209-3566</td>
<td><a href="mailto:Amy.williams12@montana.edu">Amy.williams12@montana.edu</a></td>
</tr>
<tr>
<td>Great Falls College</td>
<td>Charla Merja</td>
<td>2100 16th Avenue South Great Falls, MT 59405</td>
<td>406-771-4301</td>
<td><a href="mailto:Charla.merja@gfcmsu.edu">Charla.merja@gfcmsu.edu</a></td>
</tr>
<tr>
<td>Helena College</td>
<td>Jan Clinard, Ed. D.</td>
<td>1115 North Roberts Street Helena, MT 59601</td>
<td>406-447-6951</td>
<td><a href="mailto:Jan.clinard@umhelena.edu">Jan.clinard@umhelena.edu</a></td>
</tr>
<tr>
<td>Highlands College</td>
<td>Bernie Phelps</td>
<td>1300 W Park Butte, MT 59701</td>
<td>406-496-4565</td>
<td><a href="mailto:bphelps@mtech.edu">bphelps@mtech.edu</a></td>
</tr>
<tr>
<td>Miles Community College</td>
<td>Kirk Lacy</td>
<td>2715 Dickinson Street Miles City, MT 59301</td>
<td>406-850-1405</td>
<td><a href="mailto:lacyk@milescc.edu">lacyk@milescc.edu</a></td>
</tr>
<tr>
<td>Missoula College</td>
<td>Jennifer Young Bear</td>
<td>909 South Avenue West Missoula, MT 59801</td>
<td>406-243-7802</td>
<td><a href="mailto:Jennifer.youngbear@umontana.edu">Jennifer.youngbear@umontana.edu</a></td>
</tr>
</tbody>
</table>
### Career and Technical Student Organizations: Montana

**Agriculture Education**
- **FFA**
  - Amanda Carlson-State Director
  - MSU-Linfield Hall
  - Bozeman, MT 59717
  - (406) 994-7050
  - ffaamandac@yahoo.com

**Business Education**
- **Business Professionals of America**
  - Becky DePuydt, State Advisor
  - PO Box 232
  - Saco, MT.
  - 59261
  - beckydepuydt@bpamt.org

**DECA**
- Krista Bergstrom
  - (406) 750-1988
  - Kberg151@gmail.com

**Family & Consumer Science**
- **Family, Career, and Community Leaders of America**
  - Nicole Wanago-State Director
  - 406-581-7285
  - Nicole.wanago@mtfcccla.org

**Health Science/Biomedical Science**
- **HOSA-Future Health Professionals**
  - Megan Bones- State Director
  - MHA
  - 1720 Ninth Ave.
  - PO Box 5119
  - Helena, MT 59604
Industrial Trades

- Skills USA

Cassie Huntley-State Director
5645 Alabama Dr.
Helena, MT 59602
chuntley@skillsusamt.org
(406)461-5016

Montana Technology Student Association

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Cell: 406-690-2524
E-mail: craig@crystalcnc.com

Dwight Freeman
PO Box 288
Saco, MT 59261
Cell: 406.671.6992  Phone: 406.527.3237
E-mail: dfreeman@sacopublicschools.k12.mt.us