# Strengthening Claims-based Interpretations and Uses of Local and Large-scale Science Assessment Scores

Montana Office of Public Instruction
Science Assessment System:
Theory of Action

**January 2018**

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## Introduction to SCILLSS

The Strengthening Claims-based Interpretations and Uses of Local and Large-scale Science Assessment Scores (SCILLSS) project aims to strengthen the knowledge base among stakeholders for using principled-design approaches to create and evaluate quality science assessments that generate meaningful and useful scores, and to establish a means for states to strengthen the meaning of statewide assessment results and to connect those results with local assessments in a complementary system. The Montana Office of Public Instruction (OPI) is working in collaboration with two other state education agencies (the Wyoming Department of Education and the Nebraska Department of Education), four organizations (edCount, ACS Ventures, SRI International, and the Pacific Institute for Research & Evaluation (PIRE)), and a technical advisory panel of 10 experts that contribute an essential combination of expertise in principled-design, measurement, assessment literacy, and classroom practices to support the implementation of this project. The SCILLSS project is funded by the US Department of Education's Enhanced Assessment Instruments Grant Program.

## Purpose of State Theory of Action

All assessments are designed with a purpose in mind, and only by identifying and clarifying this purpose, or set of purposes, can one begin to determine how to evaluate the validity of the interpretations of the scores an assessment yields. A principled-design approach to assessment development enables state assessment systems to be set up in such a way that demonstrates that the end goals of the system were thought about during the design and development phase. This is achieved, in part, through the development of a Theory of Action (ToA), which demonstrates the claims and assumptions that must hold true to support the interpretation(s) and use(s) of assessment scores. Development of a ToA is essential for states to better articulate how their assessment claims connect with, and are supported by, test scores and other sources of evidence. This deep analysis of a state's argument for score meaning helps to strengthen both the validity and coherence of their system. Such an approach also provides stakeholders with ample documentation of design and development logic and decisions, which can be used for future learning, evaluations, and development projects.

Further, developing a ToA through the implementation of a principled-design approach is a key first step to ensuring that assessment development activities and objectives meet the standards of the professional testing community as communicated through the *Standards for Educational and Psychological Testing* (hereafter referred to as the *Standards*; AERA, APA, & NCME, 2014). The *Standards* are the primary guidelines used to improve upon current practices and develop new processes for assessment system evaluation and design. The ToA is an essential element of an assessment system's design that directly supports Standard 1.0: "Clear articulation of each intended test score interpretation for a specified use should be set forth, and appropriate validity evidence in support of each intended interpretation should be provided" (AERA, APA, & NCME, 2014, p. 23).

Thus, as a participating state in the SCILLSS project, Montana developed a state-specific ToA to identify the specific assessment-related claims or issues that are critical to support score meaning within their system, and contributed to the development of a common project ToA that reflects the processes, activities, and desired project outcomes shared by the participating states. The ToA is a living document that Montana OPI will update over time and throughout the duration of the project. Each update will be posted to the SCILLSS project website at www.scillsspartners.org.

## Development Process for State Theory of Action

Development of Montana's ToA was a cyclical process involving multiple stages of review and revision with a diverse representation of Montana stakeholders with varying backgrounds, experiences, and expertise in science education. Stakeholder involvement in the development and refinement of the Montana ToA was an essential consideration for ensuring the ToA articulates a common vision for science education in Montana and matches the state's unique circumstances and needs. Stakeholders that contributed to the development of Montana's ToA are summarized in Appendix A.

To help Montana and the other SCILLSS participating states establish a foundation in the structure of a ToA, the SCILLSS organizational partners first developed a ToA template and development guide. For each of the components of the ToA, state representatives were asked to consider a series of questions to articulate the guiding philosophy behind their system in which the SCILLSS project is integrated:

1. **Statewide Assessment System Design:** What are the assessment system claims? How is the assessment system designed? How must the assessment system function to provide interpretable and usable scores?
2. **System Setting and Use:** How are stakeholders meant to use assessment information? What are some of the conditions that must be in place for the assessment system to function as intended?
3. **Teacher Actions:** What activities are expected of teachers? How do teachers interact with students in the classroom? How do teachers use student work to track progress?
4. **Student Actions:** What activities are expected of students? How do students interact with teachers and other students? How do students track their progress?
5. **Student Outcomes:** What are the intended student goals, outcomes, or consequences of the assessment system (e.g., for students, teachers, instruction)?

### Onsite Collaborative Development

Validity evaluation experts convened all SCILLSS project staff at a two-day project kickoff meeting in Lincoln, Nebraska in June of 2017 and provided a comprehensive overview of principled-design, how a ToA fits within that approach, and the goals of the ToA for both the SCILLSS project and each individual state. The project staff divided participants into state-specific groups in the same room, with one validity evaluation expert assigned to each group. Facilitators posted large, blank pieces of paper that represented each of the ToA components across the room. In addition to the ToA template and development guide, experts provided state staff with paper, pens, and highlighters to use for brainstorming ideas for each of the ToA components.

Together with Erin Buchanan, group facilitator, and Dr. Ellen Forte and Dr. Howard Everson, validity evaluation experts, OPI staff – State Assessment Director, Jessica Eilertson, and OPI National Assessment of Educational Progress (NAEP) State Coordinator, Ashley McGrath – spent three hours on the first day brainstorming ideas for each of the ToA components, taking into consideration their state-specific contexts and how the SCILLSS activities and approach fit within their state activities and goals. The guiding questions provided earlier in this document assisted states in brainstorming ideas for each of the components. As they arrived at ideas for each of the ToA components, the group facilitator populated the ToA template, as well as the corresponding large, blank pieces of paper to support states in identifying their commonalities, which ultimately informed the development of a common project ToA.

Upon completion of the brainstorming activity, each state worked with their facilitator and validity evaluation expert to refine their ideas for each of the components of the state-specific ToA. The facilitator led the state staff in a discussion to reach consensus for each component, assisting to clarify language when needed. Furthermore, the facilitator and validity evaluation expert assisted the state staff in articulating the ToA in paragraph form to ensure pictorial and textual representation. At the end of the day, state partners shared out across the groups their drafted, state-specific ToAs. During the discussion, states identified common themes and differences across the state-specific ToAs. A facilitator documented the common themes which were then used to inform the development of the project theory of action.

## State Review and Refinement Activities

Following the onsite ToA development activities at the project kickoff meeting, the OPI facilitated a review and refinement period with a variety of Montana stakeholders to gather feedback for the ToA. Some of the stakeholders included in Montana's early ToA development in July of 2017 were science educators and science consultants[1]. Stakeholders who were involved in the later stages of development in November 2017 included additional OPI key staff, science teachers, administrators, legislators, Board of Public Education (BPE) members, higher education officials, Indian Education specialists, regional education service area (RESAs) members, consortia, science organization members, and parents.

### *OPI Internal Partner Review*

On July 10, 2017, Montana OPI invited members of the Content, Standards, and Instruction (CSI) Division – Division Administrator, Colet Bartow, and Science Instructional Specialist, Michelle McCarthy – and the Indian Education for All (IEFA) Division – Division Administrator, Mandy Broaddus, and Indian Education Specialist, Jennifer Stadum – to participate in a one-hour meeting to introduce the SCILLSS project and to discuss the SCILLSS timeline, draft ToA, state needs assessment, and Montana's Measured Progress contract and transition plan. The input from these OPI internal partners was to emphasize the key policy surrounding their state assessment landscape and the key players to implement any change necessary for a new three-dimensional science assessment. In addition to these recommendations, the group suggested including another layer within the ToA components or to intertwine the role of leadership in this plan. Their recommendation was to identify the key administrator actions needed to direct change. Lastly, the group helped refine the language within the ToA for clarity, consistency, and brevity.

### *PAO Workshop Science Educator Review*

In addition, on July 26-28, 2017, a group of 25 science educators and consultants met at the Process, Assessment, and Outcome (PAO) Science Formative Development Workshop after completing 15 hours of online Montana Teacher Learning Hub training to develop formative science assessments for the OPI using released NAEP science paper-pencil and computer-based assessment items. The OPI spent one-hour sharing information about SCILLSS and Montana's draft ToA with the science educators and consultants to gain their perspective. The OPI shared the tentative timeline for SCILLSS and how educators will be involved in the project. The state science educators reviewed the draft ToA, recorded notes of needs on large, blank pieces of paper (see Appendix B), and shared what elements should be of focus for the ToA and Montana's new system of assessments for science. The resulting feedback was

[1] The OPI will work with appropriate providers who offer professional development and/or outreach to science teachers through their organization (e.g., Museum of the Rockies (MOR), Clarksfork, EngiNEER Assoc., etc.).

incorporated in a second iteration of the draft ToA, which included an increased emphasis on local partnerships[2] within the state. Educator feedback from this activity is summarized below.

- The ToA sequence must follow these stages: Policy > Players > Stage/Landscape > Design > Teacher Actions > Student Actions > Outcomes/Impacts.
- Include how the policy will drive the system and needs to revise the policy based on required shifts (Montana's ARM revision needs e.g., grade assessed may need to change from grades 4, 8 and 10).
- Include Montana's dependency on partnerships to make assessment happen (Montana is a local-control state).
- Include funding and statute constraints (assessments in Montana are entirely federally funded and IEFA must be included).
- Include realistic timelines (contract with Measured Progress ends 2018-2019; must have new test in place by 2020).
- Must capitalize on natural place-based phenomena due to Montana's unique richness.
- Tie to science, technology, engineering, and mathematics (STEM) in some way to support the Every Student Succeeds Act (ESSA).

On September 8, 2017, Michelle McCarthy and Ashley McGrath met to revise the ToA draft to include the stakeholder input from both the meeting with CSI and IEFA staff as well as the meeting with Montana science educators at the PAO Workshop. This revised draft of Montana's ToA was shared at the Montana Data Use and Culture (MDUC) Montana's Formative Science Repository session on September 26, 2017, the Montana Assessment Technical Advisory Committee (TAC) on October 6-8, 2017, and the Montana 2017 Educator's Conference on October 20, 2017.

### *Science Partner Taskforce Review*

On November 13, 2017, key OPI staff, including representatives from CSI, IEFA, accreditation, special education, and 21st century learning, met for a face-to-face meeting with edCount, ACS Ventures, and various science stakeholders across the state who represent the Science Partner Taskforce. SCILLSS organizational partners, including Erin Buchanan, Liz Summers, and Andrew Wiley, and Montana OPI staff, including Ashley McGrath and Jessica Eilertson, facilitated this face-to-face meeting. Facilitators presented several key activities designed to elicit stakeholder input on the ToA. During the morning session, facilitators engaged key OPI staff in a discussion of potential policy and statutory issues, OPI's strategic priorities and milestones and how they overlap with the SCILLSS timeline, and the intended purpose and use of the OPI science assessment in the context of the larger educational setting. During the afternoon session, facilitators gathered feedback from key OPI staff and other members of the Science Partner Taskforce to inform refinements to each of the components of the ToA. Meeting agendas for the morning and afternoon sessions are provided in Appendix C.

[2] The OPI has identified key local players who have vested interests in K-12 public schools which include (but are not limited to): MACIE, RESA/CSPD, MEEA, MEA-MFT, MSTA, MSSA, PTA, Parents, Community, SAM, MPRES, GEAR UP (Montana Teacher Learning Hub), Business, Consortiums.

**Meeting participants**

Meeting participants included three SCILLSS project leads, seven OPI state leads, and 16 science taskforce members (see Appendix A). Educators were sent an electronic background questionnaire to provide information about their gender, ethnicity, education, and professional experiences. Of the 23 OPI state leads and science taskforce members in attendance, 13 completed the questionnaire. 10 participants (77.0%) identified as female, and 11 participants (84.6%) identified as white, non-Hispanic. All taskforce members hold at least a bachelor's degree, and nine educators (81.8%) hold graduate degrees. Six of 12 respondents (50.0%) are from Southeastern Montana, one respondent (8.3%) each is from each Southeastern, Northwestern, and North Central Montana. Three respondents (25.0%) identified as from other areas in Montana.

Five participants (38.5%) identified as teachers, two (14.4%) identified as school leadership or instructional coaches, and 10 (76.9%) identified as working in other roles in education. Five respondents (41.7%) indicated they have over 20 years of experience as educators or in the education field and two respondents (16.7%) indicated they have 10 to 20 years of experience. When asked about the number of years of experience working in their particular area of expertise (ELA/mathematics/science/social studies, special education, etc.), 12 participants responded. Five participants (41.7%) indicated they have over 20 years of experience, two (16.7%) have 15 to 20 years of experience, three (25.0%) have 10 to 15 years of experience, and one (8.3%) has less than 10 years of experience.

Participants also indicated they have experience with various grades and domains in science learning. Five respondents (38.5%) identified having current experience working in elementary school science and middle school Earth and Space Science. Six respondents (46.2%) identified having current experience in middle school Life Science and Physical Science, Engineering, Mathematics, and other content areas. Seven participants (53.8%) identified having current experience with high school Earth and Space Science, Life Science, and Technology. Eight respondents (61.5%) also have current experience with high school Physical Science.

Meeting participants were asked whether they had specialized training or experience in working with special populations of students, such as students with disabilities or students whose first language is not English. Of nine respondents, six (66.7%) reported having experience working with students with disabilities or English language learners. Three respondents (33.3%) have no experience working with EL students or students with disabilities.

**Theory of Action Padlet Activity**

During the Science Partner Taskforce review meeting, facilitators organized key OPI staff and science partners into small groups. Working backwards from "Student Outcomes" to "Statewide Assessment System Design" (*Student Outcomes > Student Actions > Teacher Actions > System Setting and Use > Statewide Assessment System Design),* groups evaluated the quality, clarity, and relevance of the statements in Montana's Theory of Action. Each group provided feedback in Padlet by responding to the guiding question associated with each ToA statement, and providing recommendations for how to revise and refine each ToA statement, if applicable. Once groups finished providing specific feedback and recommendations for each ToA statement, they also responded to a series of overall questions related to the general quality and clarity of the language and content within the ToA. These include:

1. Are the ToA statements clear?

2. Is the language accessible, relevant and reflective of our state priorities?
3. Is there any redundancy? If so, can this be collapsed?
4. Do any sections need to be parsed out?
5. Is there anything missing?
6. How is the final draft messaged to the field?
7. How do we stage this component and subcomponents to match the needs of the field?

The results from the activity and discussion are summarized in Appendix D.

#### *Public Comment Period*

Following this meeting with state partners, Montana OPI organized a public comment period from November 13 to January 15 to elicit additional input for the Montana ToA from district representatives and other interested stakeholders. Montana OPI advertised the public comment period via a series of three monthly assessment newsletters and activity summaries (November 2017 through January 2018). The ToA was also shared with the Montana Board of Education to keep them apprised of OPI's work at the agency and with the field. The public comment period did not elicit any feedback to inform improvements to the Montana Theory of Action.

Following the public comment period, and based on feedback from the November 13 meeting with members of the Science Partner Taskforce, OPI staff applied revisions to the Montana Theory of Action and disseminated the revised version to the Science Taskforce Members for final approval.

## Theory of Action

Montana developed a ToA that articulates the characteristics and priorities of its state science assessment system in the context of the larger educational setting. These priorities are necessary for meeting its five desired outcomes: 1) ensuring Montana students have an increased interest in, engagement with, and participation in the Montana Content Standards (MCS, 2016) for science curriculum and the assessment system which measures their attainment of these defined knowledge, skills, and abilities, 2) ensuring Montana students become critical consumers of information, and apply and transfer MCS (2016) for science learning to complex and novel situations thus demonstrating globally competitive skill sets necessary for postsecondary success, 3) ensuring Montana students are well prepared to enter postsecondary training and degree programs without remediation in science and can participate in postsecondary pursuits without accruing added remediation expenses to complete certification or degrees, 4) ensuring the Montana assessment system will provide student experiences that effectively integrate the three-dimensional nature of the MCS for science (2016) in authentic and culturally-relevant ways (Indian Education for All (IEFA), place-based, and phenomena-drive), and 5) ensuring the science assessment system which feeds the Office of Public Instruction (OPI) accountability system will yield score results which are timely and informative to stakeholders at every level to help students make progress over time to address real-time learning gaps for intervention.

To achieve these outcomes, Montana students must develop beliefs and take actions that support their science learning. Students must recognize relationships between their learning and community, and pursue additional science learning experiences and opportunities for economic, civic, and community development within and outside of the K-12 system. Students must take ownership in their science learning through the ability to establish and track learning goals, and use actionable data from the

formative assessment process to understand where they are in relation to the MCS (2016) for science learning goals. Montana students must have increased interest in, engagement with, and knowledge of Montana's American Indian tribes and their contribution to science. Further, students should understand how their own commitment to science learning relates to community advocacy, postsecondary preparedness, and progress toward a career pathway in STEM, and recognize the relationship between their science learning and the potential careers in STEM fields. Additionally, Montana students should use the MCS (2016) for science to increase knowledge, skills, and abilities essential for solving human problems and being contributing members with adept 21st Century Skills.

Montana teachers and administrators must also take action to create an environment that supports these student beliefs and behaviors. Montana teachers must cultivate student interest and engagement in science, technology, reading, engineering, arts, and mathematics (STREAM) using learning experiences that are authentic, phenomena-centered and place-based. Given the appropriate resources, teachers will guide students through a formative assessment process that tracks instruction through a clear and research-based progression of learning aligned to the essential knowledge, skills, and abilities of the MCS (2016) for science. They will use differentiated instruction to give all students opportunities for personalized learning that meets the rigor of the MCS (2016) for science. They will also deliver and assess IEFA content that is aligned with the MCS (2016) for science for appropriate and meaningful integration. For teachers to achieve these ends, school administrators must: 1) facilitate policy changes and access to resources that support teachers and students with opportunities to experience individualized learning across the curriculum, including STEM, and have access to technology; 2) provide the resources, professional development opportunities, and direction that support teachers in implementing a formative assessment process; and 3) create the conditions flexible and permissive enough for teachers to cultivate student interest and engagement in STEM.

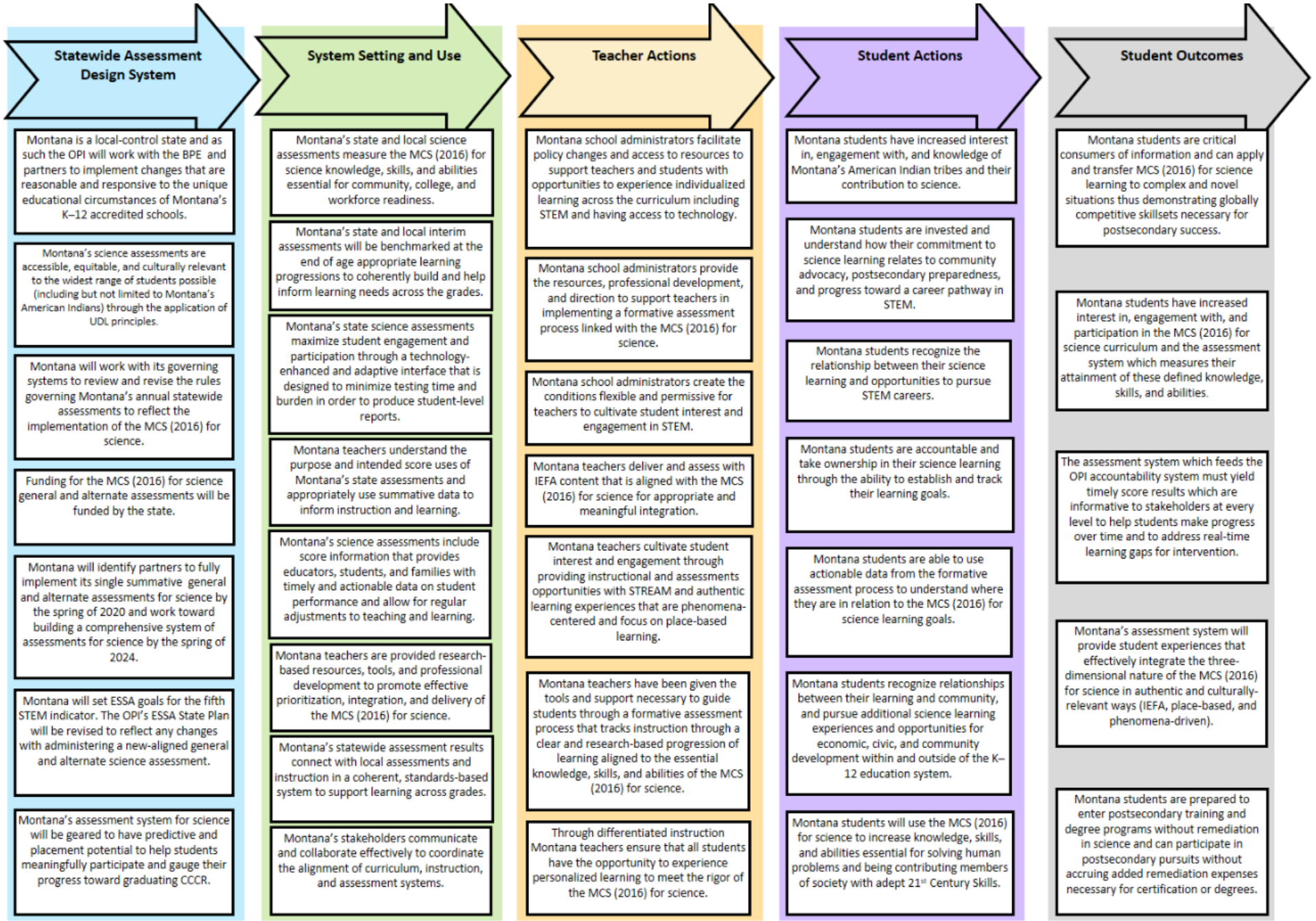
The system setting and use of the Montana state and local science assessments will lay the groundwork for these teacher and administrator actions. As a key component of the educational system, Montana's state science assessment must be designed to measure the knowledge, skills, and abilities in the MCS (2016) for science that are essential for college-, workforce-, and community-readiness. The state assessment system must maximize student engagement and participation through a technology-enhanced, adaptive interface that minimizes testing time and burden and produces student-level reports. Montana's statewide assessment results must connect with local assessments and instruction in a coherent, standards-based system that supports learning across grades, and assessments at all levels must include score information that provides stakeholders with timely, actionable data on student performance; stakeholders must communicate and collaborate to effectively coordinate the alignment of curriculum, instruction, and assessment systems and make regular adjustments to teaching and learning. To support these intended uses, Montana's state and local interim assessments will be benchmarked at the end of age-appropriate learning progressions to coherently build and help inform learning needs across grades, and Montana teachers must have access to research-based resources, tools, and professional development to promote effective prioritization, integration, and delivery of MSC (2016) for science. Teachers must understand the purpose and intended score uses of Montana's large-scale assessment and appropriately use summative data from the assessment to inform instruction and learning.

Finally, the statewide science assessment system design must support the applications described above. A state science assessment implemented within this closely-aligned system must be designed to be accessible, equitable, and culturally appropriate to the widest range of students possible (including but not limited to Montana's American Indians) through the application of Universal Design for Learning

(UDL) principles. It must have predictive and placement potential to help students meaningfully participate and gauge their progress towards graduating Condition of College and Career Readiness (CCCR). Funding for the MCS (2016) for science general and alternate assessments will be funded by the state. As Montana is a local-control state, OPI will work with its governing systems and partnerships to implement changes that are reasonable and responsive to the unique educational circumstances of Montana's K-12 accredited schools. Montana will work with its governing systems to review and revise the statute governing Montana's annual statewide assessments to reflect the implementation of the MCS (2016) for science, and will identify partners to fully implement its single summative general and alternate assessments for science by the spring of 2020 and work toward building a comprehensive system of assessments by the spring of 2024. Montana will set ESSA goals for the fifth STEM indicator, and will revise the OPI's ESSA state plan to reflect any changes with administering a new aligned general and alternate science assessment.

A pictorial representation of the Montana ToA is provided in Exhibit 1. First, the five components are displayed together to show how they are combined to comprise the assessment system; then, each component of the ToA is provided separately as a bulleted list. Terms and phrases highlighted in bold in the ToA are defined in the Glossary of Terms following the exhibit.

**Exhibit 1. Montana Theory of Action**



## Statewide Assessment System Design

The monies for all state assessment come solely from the state. OPI considers the "Statewide Assessment System Design" claims to be the infrastructure and parameters necessary to guide the next succession of the ToA. This includes considerations such as state statutory requirements, OPI's funding source, and OPI's process for changing or getting approval for new assessments.

### *Statewide Assessment System Design Claims*

- Montana is a **local-control state** and as such the OPI will work with the **BPE** and **partnerships** to implement changes that are reasonable and responsive to the unique educational circumstances of Montana's **K-12 accredited schools**.
- Montana's science assessments are accessible, equitable, and culturally relevant to the widest range of students possible (including but not limited to **Montana's American Indians**) through the application of UDL principles.
- Montana will work with its **governing systems** to review and revise the rules governing Montana's annual statewide assessments to reflect the implementation of the MCS (2016) for science.
- Funding for the MCS (2016) for science general and alternate assessments will **be funded by the state.**
- Montana will identify partners to fully implement its single summative general and alternate assessments for science by the spring of 2020 and work toward building a **comprehensive system of assessments** for science by the spring of 2024.
- Montana will set ESSA goals for the fifth STEM indicator. The OPI's ESSA State Plan will be revised to reflect any changes with administering a new aligned general and alternate science assessment.
- Montana's assessment system for science will be geared to have predictive and placement potential to help students meaningfully participate and gauge their progress toward graduating CCCR.

## System Setting and Use

The OPI considers the "System Setting and Use" claims to be the state action and feedback loop. These claims articulate the necessary partnerships Montana must have in place to implement science assessment changes and how these partnerships will guide the next steps of the ToA or inform them.

### *System Setting and Use Claims*

- Montana's state and local science assessments measure the MCS (2016) for science knowledge, skills, and abilities essential for **community, college, and workforce readiness.**
- Montana's state and local interim assessments will be benchmarked at the end of age appropriate learning progressions to coherently build and help inform learning needs across the grades.
- Montana's science assessments maximize student engagement and participation through a technology-enhanced, adaptive interface that is designed to minimize testing time and burden in order to produce student-level reports.
- Montana teachers understand the purpose and intended score uses of Montana's state assessments and appropriately use summative data from the assessment to inform instruction and learning.

- Montana's science assessments include score information that provides educators, students, and families with timely and actionable data on student performance and allow for regular adjustments to teaching and learning.
- Montana teachers are provided research-based resources, tools, and professional development to promote effective prioritization, integration, and delivery of the MCS (2016) for science.
- Montana's statewide assessment results connect with local assessments and instruction in a coherent, standards-based system to support learning across grades.
- Montana's stakeholders communicate and collaborate effectively to coordinate the alignment of curriculum, instruction, and assessment systems.

## Teacher Actions

The OPI considers the "Teacher Actions" claims as the local actions and leadership necessary to guide the system toward meaningful student outcomes. Without the identified players and goals defined in these claims, useable student outcomes are limited.

### *Teacher Actions Claims*

- Montana school administrators facilitate policy changes and access to resources to support teachers and students with opportunities to experience individualized learning across the curriculum, particularly including **STEM and access to technology**.
- Montana school administrators provide the resources, **professional development opportunities**, and direction to support teachers in implementing a **formative assessment process** linked with the MCS (2016) for science.
- Montana school administrators create conditions flexible and permissive enough for teachers to cultivate student interest and engagement in STEM.
- Montana teachers deliver and assess with IEFA content that is aligned with MCS (2016) for science for appropriate and meaningful integration.
- Montana teachers cultivate student interest and engagement through providing instructional and assessments opportunities with science, technology, reading, engineering, arts, and mathematics (STREAM) and authentic learning experiences that are **phenomena-centered** and focus on **place-based learning.**
- Montana teachers have been given the **tools and support necessary** to guide students through a formative assessment process that tracks instruction through a **clear and research-based progression of learning** aligned to the essential knowledge, skills, and abilities of the MCS (2016) for science.
- Through **differentiated instruction**, Montana teachers ensure that all students have the opportunities to experience **personalized learning** to meet the **rigor** of the MCS (2016) for science.

## Student Actions

The OPI considers the "Student Actions" claims as describing the students' role in taking ownership in their learning in order to reach the identified student outcomes. This is an interrelated system that requires both the teacher and the student to make any progress toward the identified student outcomes.

### *Student Actions Claims*

- Montana students have increased interest in, engagement with, and knowledge of **Montana's American Indian tribes** and their contributions to science.
- Montana students are invested and understand how their commitment to science learning relates to **community advocacy, postsecondary preparedness** and progress toward a **career pathway in STEM.**
- Montana students recognize the relationship between their science learning and the potential careers they may pursue in STEM fields.
- Montana students are accountable and take **ownership** in their science learning and are able to establish and track their learning goals.
- Montana students are able to use **actionable data** from the formative assessment process to understand where they are in relation to the MCS (2016) for science learning goals.
- Montana students recognize relationships between their learning and community, and pursue additional science learning experiences and opportunities for economic, civic, and community development within and outside of the education system.
- Montana students will use the MCS (2016) for science to increase knowledge, skills, and abilities essential for solving human problems and being contributing members with adept **21st Century Skills**.

## Student Outcomes

The OPI considers the "Student Outcomes" claims to be the overarching goals of K-12 science education and the K-12 system of assessments for science.

### *Student Outcomes Claims*

- Montana students are critical consumers of information, and can **apply** and **transfer** Montana Science Standards (2016) science and engineering practices in society, demonstrating **competitiveness in a global market**.
- Montana students have increased interest in, engagement with, and participation in the MCS (2016) for science curriculum and the assessment system which measures their attainment of these defined knowledge, skills, and abilities.
- The assessment system which feeds the OPI accountability system must yield timely score results which are informative to stakeholders at every level to help students make progress over time and to address real-time learning gaps for intervention.
- Montana's assessment system will provide student experiences that effectively integrate the three-dimensional Montana Science Standards (2016) in authentic, and culturally-relevant ways (IEFA, place-based, and phenomenon-driven).
- Montana students are prepared to enter post-secondary training and degree programs without remediation in science and can participate in postsecondary pursuits without accruing added remediation expenses necessary for certification or degrees.

## Glossary of Terms

### Statewide Assessment Design System

| | |
|---|---|
| Accredited schools | The OPI must provide assessments to all public and non-public accredited schools. |
| Governing Partnerships | There is no one group that can make changes to rule; therefore, the OPI in partnership with the identified governing system need to go through the appropriate processes to enact revision (e.g., Board of Public Education, Montana University System (pre-service), Accreditation (in-service), Interim and Education Legislative Group, and the Superintendent of Public Schools). |
| Governing Systems | These are the policymakers and legislators who have the role and authority in coordination with one another to make changes to existing statute (e.g., Board of Public Education, Interim and Education Legislative Group (ELG), and the Superintendent of Public Schools (State Chief)). |
| Inclusion of Montana's American Indians | Pursuant to Art. X., sec. 1(2) of the Montana Constitution and §20-1-501 and §20-9-309(2)(c), MCA, the implementation of these standards must incorporate the distinct and unique cultural heritage of American Indians. |
| Local-control State | The Board of Public Education adopts a regular schedule for revision of statute that relies on collaboration with the OPI, school leaders, and current research. In providing and funding the basic system, the legislature has the constitutional duty and fiduciary responsibility to oversee the development of standards on which the basic system is built. The legislature also intends to ensure the local control of schools in each district by the trustees elected by the people of that district. While responsible for meeting the minimum standards required of schools within the basic system, local trustees also have the autonomy to govern their schools as entrusted by their voters. The legislature intends to resist the nationalization and standardization of education to ensure that Montana's basic system truly develops the full educational potential of each individual. It is the state's responsibility to adopt standards and it is the district's responsibility to implement these content standards with curriculum that is aligned (10.55.701). |
| Montana Science Standards (2016) | In September 2016, the OPI adopted Framework-based standards with performance expectations largely related to the Next Generation Science Standards. Montana's science standards are on the OPI's "Cycle IV" revision schedule, meaning from January 2023-July 2025 new standards would be considered.<br>• Research and Review - January-April 2023<br>• Revision - May-October 2023<br>• Negotiated Rulemaking - November 2023-March 2024<br>• Adoption - September 2024<br>• Begin Implementation - July 1, 2025 |

## System Setting and Use

College and Workforce Readiness

The goal of the OPI is to ensure that every student graduates from high school prepared to succeed in college, the military, or the workforce. A college- and career-ready student has the following:

- **Academic and Technical Knowledge and Skills -** A college- and career-ready student is prepared to complete a freshman level postsecondary course of study without remediation as demonstrated by:
  - Completion of a rigorous high school curriculum;
  - Participation in college preparation and college level courses;
  - Participation in career preparation programs; and
  - An understanding of college and career planning and the admissions and financial aid process.
- **Employability Knowledge and Skills -** A college- and career- ready student is prepared to connect his or her education to employment opportunities, as demonstrated by:
  - Goal setting and planning;
  - Clear and effective communication skills;
  - Critical thinking and problem-solving skills;
  - Working independently and in teams;
  - Effective knowledge and use of technology; and
  - Ability to work with diverse groups.
- **Work Ethic and Professionalism -** A college- and career- ready student understands the expectations of the workplace as demonstrated by:
  - Attendance and punctuality expected by the workplace;
  - Workplace appearance appropriate for position and duties;
  - Motivation and taking initiative, taking projects from initiation to completion; and
  - Understanding workplace culture, policy and safety, and respecting confidentiality and workplace ethics.
- **Measures for Career Readiness -** A student is career-ready if he or she has identified a career pathway and has completed three or more of the following benchmarks while in high school:
  - 90 percent attendance;
  - 25 hours of community service;
  - Industry credential or certificate;
  - Career pathway course with college credit;
  - Work-based learning experience;
  - Two or more organized co-curricular activities such as a Career and Technical;

- Student Organization (CTSO);
- An understanding of career choices based on employment and labor market statistics; and
- An ability to analyze the cost of college as it relates to a variety of careers and occupations.

**Teacher Actions**

| | |
|---|---|
| Differentiated Instruction | Instruction that is customized for learners to meet their individual needs, often involving providing different students with different options for acquiring content, processing and constructing information, or making sense of ideas. |
| Formative Assessment Process | A deliberate process used by teachers and students during instruction that provides actionable feedback used to adjust ongoing teaching and learning strategies to improve students' attainment of curricular learning targets/goals. At least three checkpoints are evident in this process, (1) identifying the learning goal, (2) eliciting evidence to support understanding of the learning goal, and (3) identifying opportunities to act on the evidence to adjust ongoing teaching and learning.<br><br>Source: https://www.smarterbalanced.org/wp-content/uploads/2015/09/Formative-Assessment-Process.pdf |
| Meaningful Integration of IEFA | Instruction that focuses on IEFA means it is authentic and appropriate to the unique and distinct cultural heritage of American Indians. Furthermore, this requires the integration to be deliberate and not simply an add-on to any curriculum. |
| Natural Place-Based Phenomenon | Natural phenomena are events that occur in the universe that we can use our science knowledge to explain or predict. Natural place-based phenomena describe observable events in nature (or our lives) that connect to events in our state.<br><br>Source: https://issuu.com/achieveinc/docs/using_phenomena_in_ngss |
| Personalized Learning | A variety of learning experiences that are provided to students based on a learner-centered approach to address interest, ability, and goals.<br><br>Source: http://edglossary.org/personalized-learning/ |
| Professional Development Opportunities | Any training that the field receives in pursuant of the following (ARM 10.55.714): (a) shall be aligned with district educational goals and objectives; (b) focuses on teachers as central to student learning and includes all other members of the school community; (c) focuses on individual, collegial, and organizational improvement; (d) respects and nurtures the intellectual and leadership capacity of teachers, principals, and others in the school community; (e) reflects proven research and practice in teaching, learning, and leadership; (f) enables teachers to develop further experience in subject content, teaching strategies, uses of technologies, and other essential elements in teaching to high standards; (g) promotes continuous inquiry and improvement embedded in the daily |

| | |
|---|---|
| | life of schools; (h) is ongoing and sustained; (i) is planned collaboratively by those who will participate in and facilitate that development; (j) requires substantial time and other resources; (k) is driven by a coherent long-term plan; and (l) is evaluated on the impact of professional development on teacher effectiveness and student learning, and the results of this assessment guides subsequent professional development. |
| Progression | The notion of learning as a development process or progression which is designed to help children continually build on and revise their knowledge, skills, and abilities starting from their curiosity about they see around them and their initial conceptions about how the world works. This term can also refer to instruction that is either grade-appropriate (for example, this could refer to meeting the student where they, or refer to foundational knowledge, or refer to having the student build on existing knowledge to attain new information).<br><br>Source: https://www.nap.edu/read/18290/chapter/11 |
| Rigor | Used synonymously with cognitive demand, this term is used to describe the complexities of student thought as they relate to the "types of thinking" students possess.<br><br>Source: http://schools.nyc.gov/NR/rdonlyres/D106125F-FFF0-420E-86D9-254761638C6F/0/HessArticle.pdf |
| STEM | This is the acronym used to describe instruction or learning experiences in science, technology, engineering and mathematics. |

**Student Actions**

| | |
|---|---|
| 21st Century Skills | Skills defined under the P21 Partnership for 21st Century learning include the ability to collaborate, communicate, and think critically and creativity.<br><br>Source: http://www.p21.org/our-work/p21-framework |
| Montana's Indian Tribes | The unique and distinct cultural heritage of the Blackfeet Tribe of the Blackfeet Reservation, Chippewa Cree Tribe of the Rocky Boy's Reservation, Confederated Salish & Kootenai Tribes of the Flathead Reservation, the Crow Tribe of the Crow Reservation, Fort Belknap Tribes (Assiniboine and the Gros Ventre) of the Fort Belknap Reservation, and the Fort Peck Tribes (Assiniboine & Sioux Tribes) of the Fort Peck Reservation. |
| Ownership | The act or ability to identify learning needs, supports, and goals to make progress toward graduating high school college-, career-, and community-ready. |
| Real-time Data | Actionable evidence of student learning that can inform decisions in a time-sensitive manner. |
| School Preparedness | A college- and career-ready student is prepared to complete a freshman level postsecondary course. |

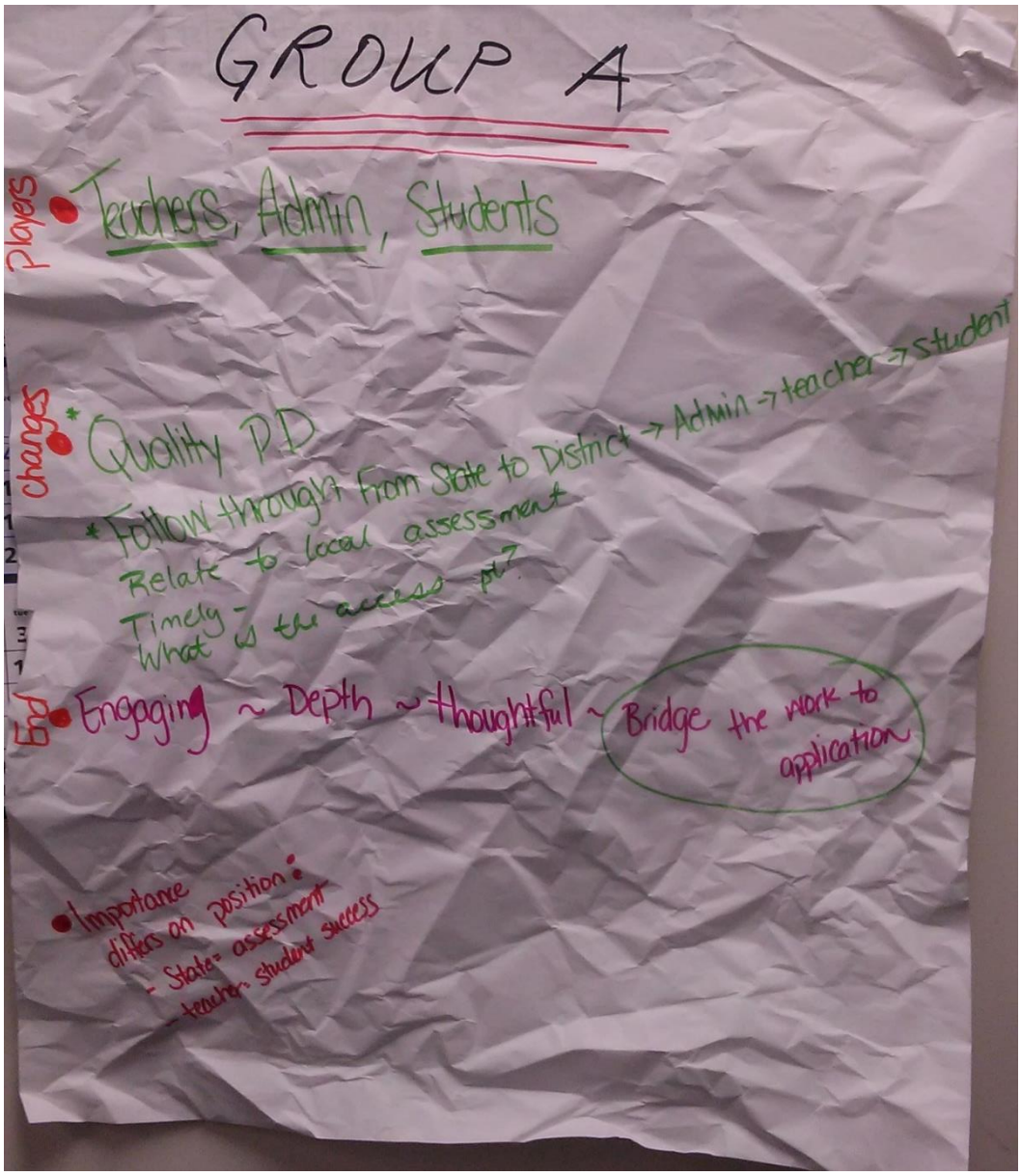
**Student Outcomes**

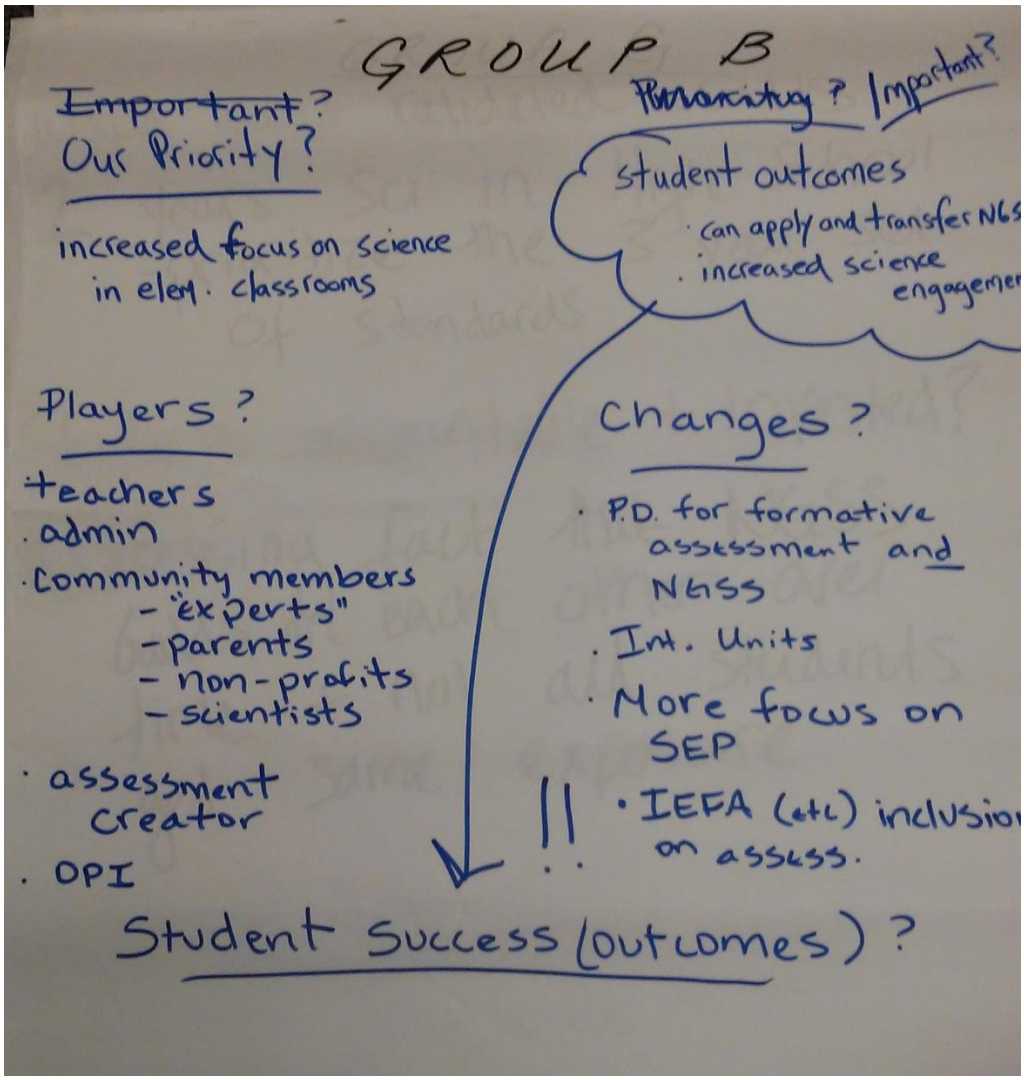
| | |
|---|---|
| Apply | Students are able to take their knowledge, skills, and abilities and put them to use given an existing situation or event. |
| Competitiveness in a Global Market | Students are able to connect their education to employment opportunities.<br><br>Source: https://drive.google.com/file/d/0B34l3UA3OHHnbG9QUFNGdl84Sms/view |
| Transfer | Students are able to take their knowledge, skills, and abilities and put them to use given new situations or events. |

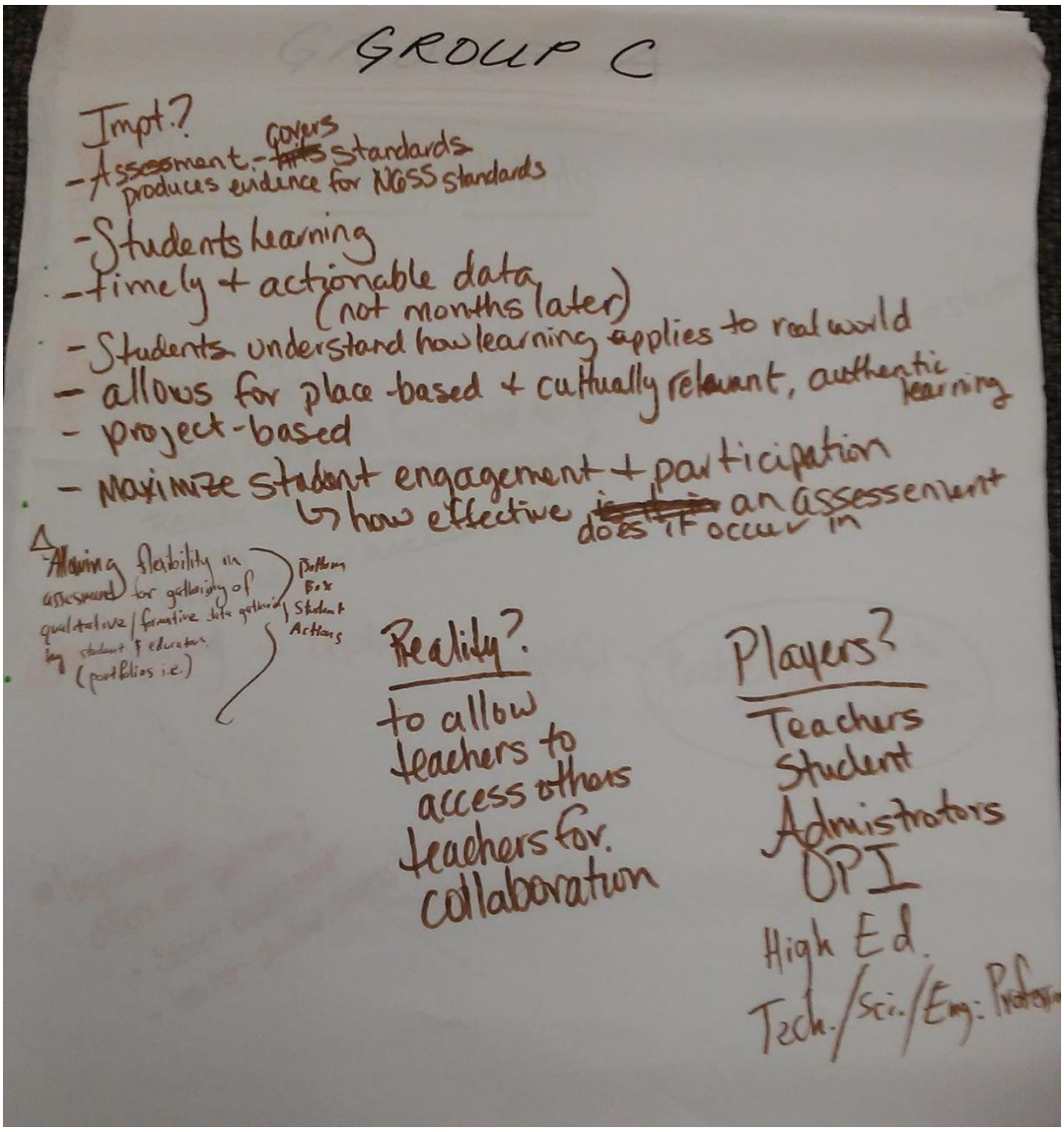
## Appendix A. Theory of Action Contributors

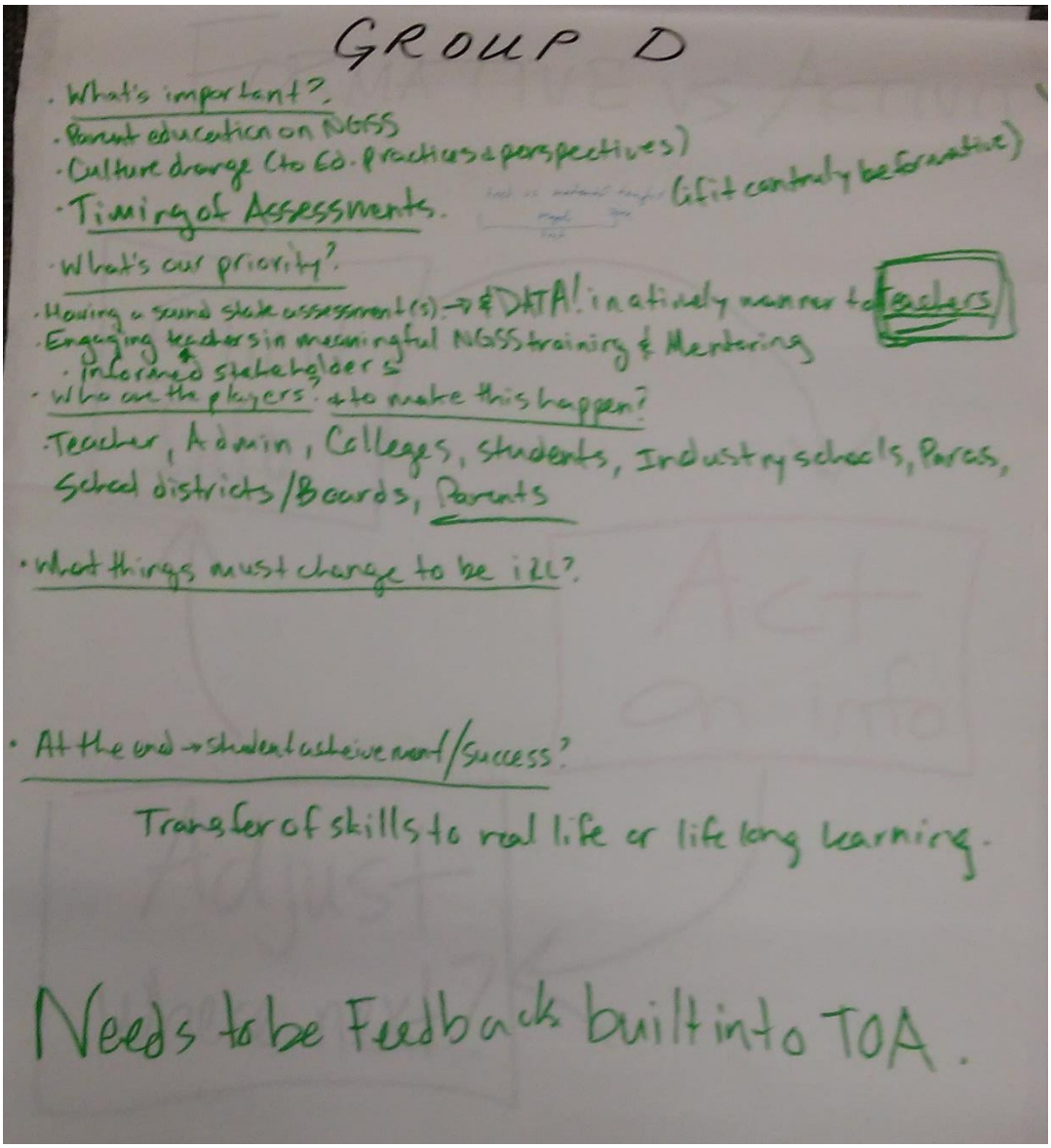
| Date | Event | Contributor and Role |
|---|---|---|
| **June 16-18, 2017** | SCILLSS Kickoff in Lincoln, NE | • **Group Facilitator** – Erin Buchanan<br>• **Validity Evaluation Experts** – Ellen Forte and Howard Everson<br>• **Montana State Staff** – Jessica Eilertson and Ashley McGrath |
| **July 10, 2017** | Theory of Action in Helena, MT | • **OPI Staff** – Ashley McGrath, Jessica Eilertson, Mandy Broaddus, Colet Bartow, Michelle McCarthy, and Jennifer Stadum |
| **July 26-28, 2017** | PAO Science Workshop in Helena, MT | • **Project Lead** – Ashley McGrath<br>• **Facilitators** – Jessica Eilertson, Michelle McCarthy, Marcy Fortner, Yvonne Field, Chris DeWald, Jennifer Stadum, and Sue Mohr<br>• **PAO Science Teachers** – Marshall Lagge, Bruce Dudek, Amanda Obery, Emily Currier, John Deming, Jared Betz, Lily Haines, Nicole Kirschten, Katie Burke, Melissa Johnson, Lindsay Manzo, Debbie Hanson, Maureen Karlin, Jacqueline Marshall, Brian Williams, Jodi Hall, Audrey Howard, Roni Sells, Monica Tomayer, Katherine Aune, Karen Pollari, Molly Ward, Mary Williams, and Summer Graber |
| **September 8, 2017** | Implement Revisions | • **Montana State Staff** – Ashley McGrath and Michelle McCarthy |
| **November 13, 2017** | Science Partner Taskforce Meeting in Helena, MT | • **SCILLSS Project Leads:** Liz Summers, SCILLSS Project Director, Erin Buchanan, SCILLSS Deputy Project Director, and Andrew (Drew) Wiley, Psychometrician<br>• **OPI State Lead Attendees:** Jessica Eilertson, Ashley McGrath, Michelle McCarthy, Mike Jetty, Mary Ellen Earnhardt, Sue Mohr, Colet Bartow<br>• **Science Taskforce Members:** Dot Wood, Jason Nieffer (Remote), Judy Boyle, Dee Hensley-Maclean, Chris DeWald, Linda Rost (Remote), Elizabeth Standley, Peter Donovan, Katie Burke, Amanda Obery, Maureen Driscoll, Jared Betz, Kim Popham, Angela McLean, Diana Knudson, and Melissa Tovaas. |

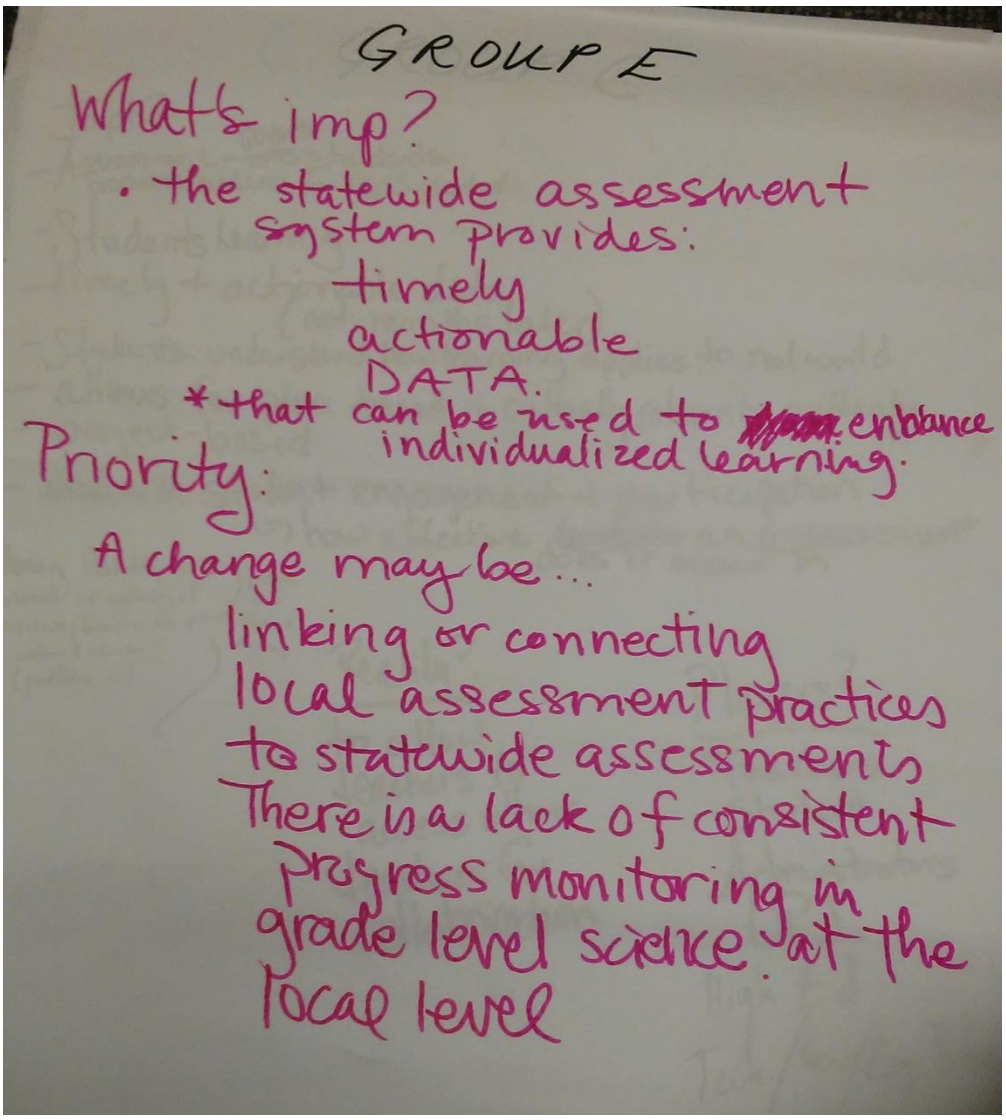
## Appendix B. PAO Workshop Feedback for Theory of Action

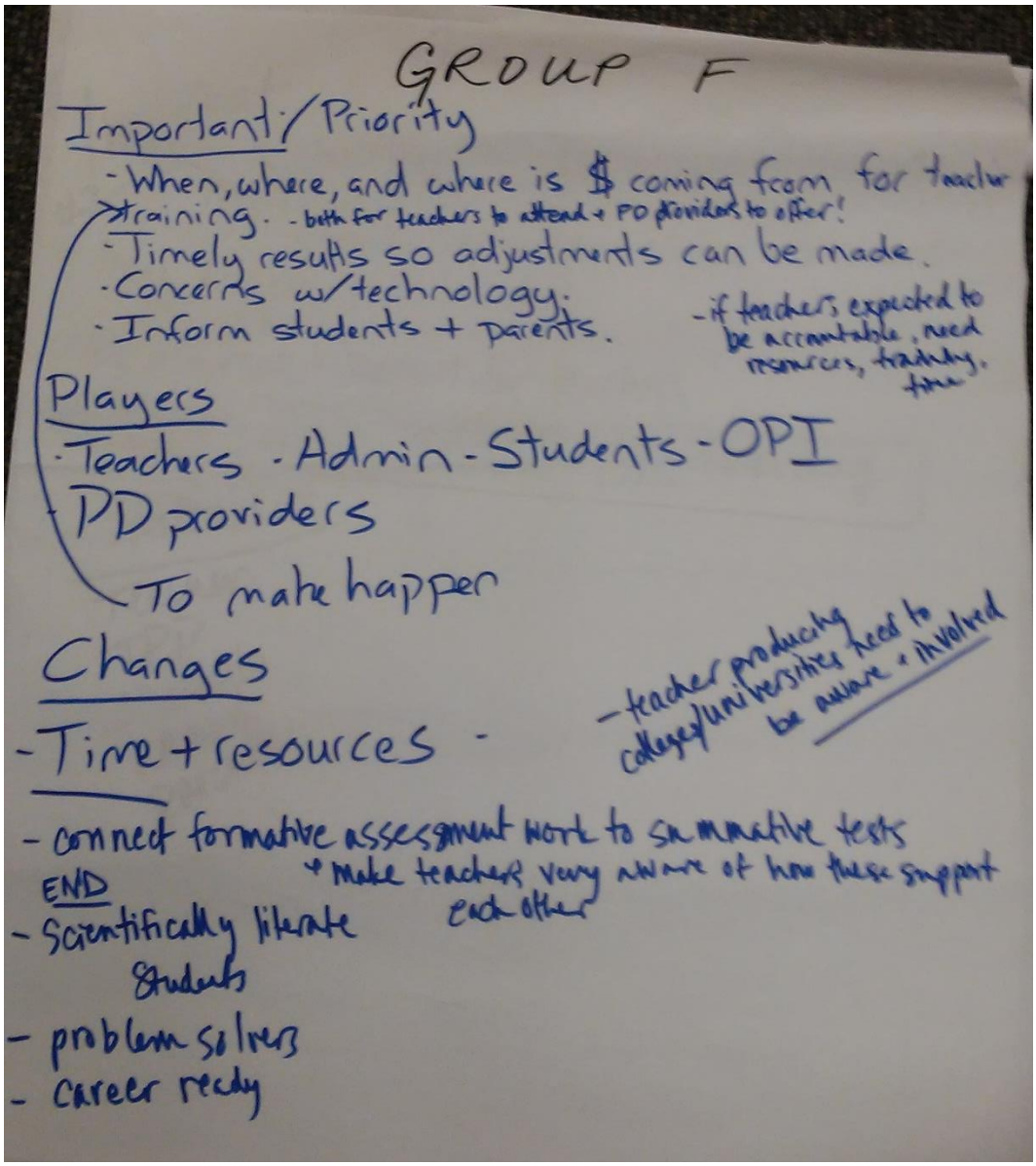


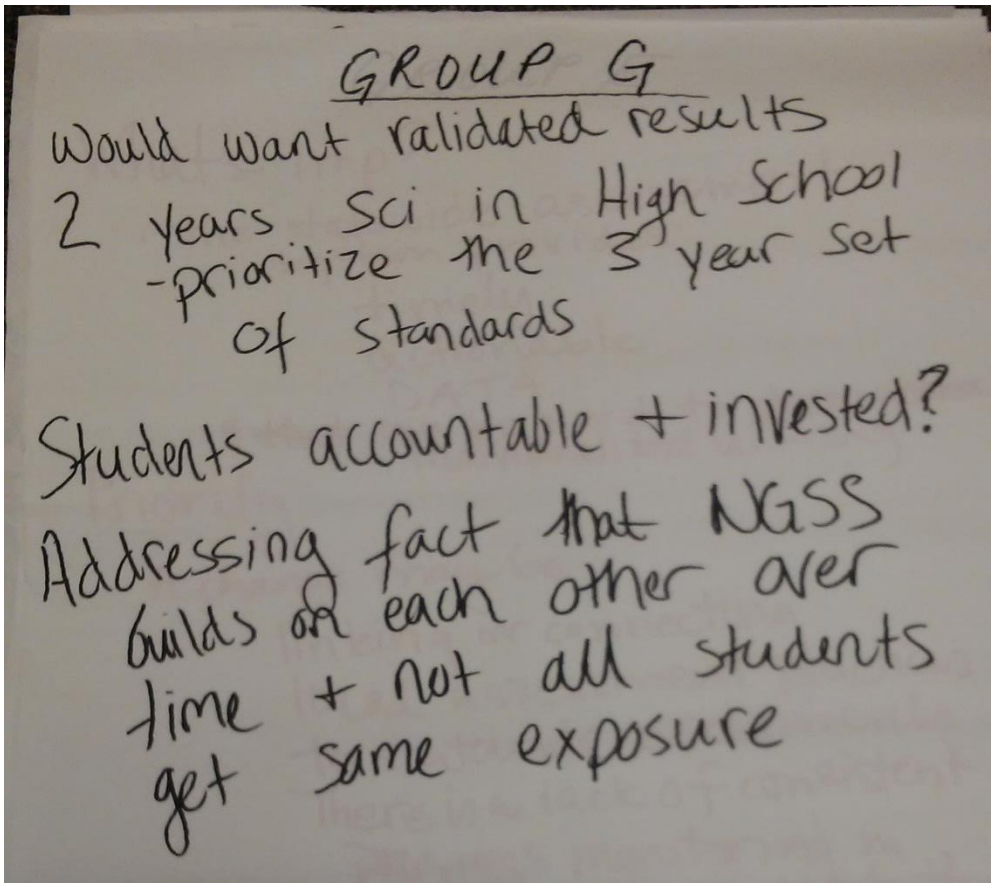

GROUP B
~~Important~~?
Our Priority?
increased focus on science in elem. classrooms
Priority? Important?
student outcomes
· can apply and transfer NGS
· increased science engagemer
Players?
·teachers
· admin
· community members
- "experts"
- parents
- non-profits
- scientists
· assessment creator
· OPI
Changes?
· P.D. for formative assessment and NGSS
· Int. Units
· More focus on SEP
· IEFA (etc) inclusio on assess.
Student Success (outcomes)?

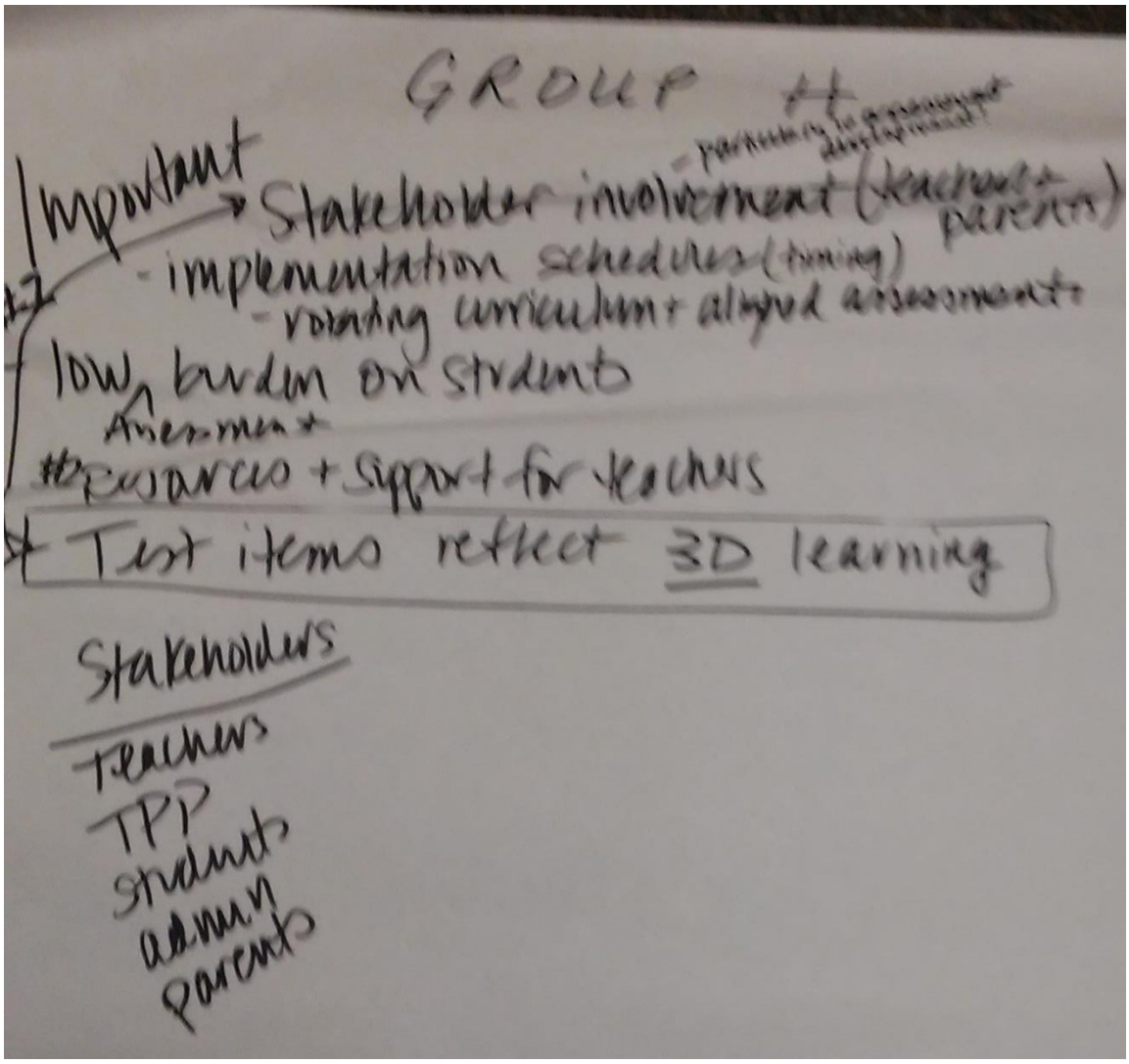

GROUP C
Impt?
- Assessment - covers standards produces evidence for NGSS standards
- Students learning
- timely + actionable data (not months later)
- Students understand how learning applies to real world
- allows for place-based + cultually relevant, authentic learning
- project-based
- Maximize student engagement + participation
↳ how effective an assessment does it occur in
Allowing flexibility in assessment for gathering of qualitative / formative data gathered by student & educator (portfolios i.e.)
Outside Box Student Actions
Reality?
to allow teachers to access others teachers for collaboration
Players?
Teachers
Student
Administrators
OPI
High Ed.
Tech./Sci./Eng: Profess


GROUP D
· What's important?
· Parent education on NGSS
· Culture change (to GO · practices & perspectives)
· Timing of Assessments. (if it can truly be formative)
· What's our priority?
· Having a sound state assessment(s) → & DATA! in a timely manner to teachers
· Engaging teachers in meaningful NGSS training & Mentoring
· Informed stakeholders
· Who are the players & to make this happen?
Teacher, Admin, Colleges, students, Industry, schools, Paras, School districts/Boards, Parents
· What things must change to be i2L?
· At the end → student achievement/success?
Transfer of skills to real life or life long learning.
Needs to be Feedback built into TOA.


GROUP E
What's imp?
• the statewide assessment system provides:
timely
actionable
DATA.
* that can be used to enhance individualized learning.
Priority:
A change may be...
linking or connecting local assessment practices to statewide assessments
There is a lack of consistent progress monitoring in grade level science at the local level


GROUP F
Important/Priority
- When, where, and where is $ coming from for teacher training. - both for teachers to attend + PD providers to offer!
- Timely results so adjustments can be made.
- Concerns w/ technology.
- Inform students + parents.
- if teachers expected to be accountable, need resources, training, time
Players
- Teachers - Admin - Students - OPI
- PD providers
To make happen
Changes
- Time + resources -
- teacher producing college/universities need to be aware + involved
- connect formative assessment work to summative tests
* make teachers very aware of how these support each other
END
- Scientifically literate Students
- problem solvers
- career ready


GROUP G
Would want validated results
2 years Sci in High School
-prioritize the 3 year set of standards
Students accountable + invested?
Addressing fact that NGSS builds on each other over time + not all students get same exposure


GROUP
Important
Stakeholder involvement (teachers + parents)
- implementation schedules (timing)
- rotating curriculum + aligned assessments
low burden on students
resource + support for teachers
Test items reflect 3D learning
Stakeholders
Teachers
TPP
students
admin
parents

## Appendix C. Science Partner Taskforce Meeting Agendas

SCILLSS 2017 State Onsite Visit

# Agenda

Monday, November 13
8:00 AM – 5:00 PM

Helena College
1115 N Roberts Street, Lower Level, Helena, MT 59601

### Meeting Goals

- Introduce our participation in the Strengthening Claims-Based Interpretations and Uses of Local and Large-Scale Science Assessments (SCILLSS) project
- Facilitate a breakfast discussion with state leads to discuss potential policy and statutory issues in Montana for the design and administration of a new, innovative science assessment in spring of 2020
- Establish a SCILLSS timeline that overlaps with the Office of Public Instruction's (OPI) strategic priorities to assist in communicating with various stakeholders and discuss the benefits of SCILLSS activities as they relate to the OPI's science assessment development
- Develop a shared understanding of the questions, recruitment plan/process/language, and timeline of activities for the local needs assessment pilot study
- Elicit input from state partners on the purpose and vision for state science assessment scores and gather feedback to inform refinements to the OPI Science Theory of Action for implementation
- Discuss questions and next steps for moving forward with SCILLSS work

### Monday, November 13

| | | |
|---|---|---|
| **8:00 a.m. – 9:30 a.m.** | **Breakfast and Discussion:** Identify and address potential policy and statutory issues in Montana for the design and administration of a new, innovative science assessment in the spring of 2020 | Helena College<br>Lower Level<br>Room 002/003 |
| **9:30 a.m. – 11:30 p.m.** | **OPI Timeline:** Establish a SCILLSS timeline that overlaps with the OPI's strategic priorities to assist in communicating with various stakeholders. Discuss the benefits of SCILLSS activities as they relate to the OPI's science assessment development | Liz Summers<br>Erin Buchanan<br>State Leads |
| **11:30 a.m. – 12:00 p.m.** | **LEA Recruitment:** Review questions, recruitment plan/process/language, and timeline of activities for the local needs assessment pilot study | Andrew Wiley<br>State Leads |
| **12:00 p.m. – 12:30 p.m.** | **Lunch** | Helena College<br>Lower Level<br>Room 002/003 |
| **12:30 p.m. – 1:00 p.m.** | **Welcome/Orientation for State Partners** | Jessica Eilertson<br>Ashley McGrath |
| **1:00 p.m. – 4:30 p.m.** | **State Partner Taskforce:** Elicit input from state partners on the purpose and vision for state assessment scores, and gather input to finalize the OPI Science Theory of Action for implementation | Ashley McGrath<br>Michelle McCarthy<br>Erin Buchanan |
| **4:30 p.m. – 5:00 p.m.** | **Wrap Up/Questions and Next Steps** | Jessica Eilertson<br>Liz Summers |

# SCILLSS 2017 State Onsite Visit: Meeting with State Science Partners

## Agenda

Monday, November 13
12:30 PM – 5:00 PM

Helena College
1115 N Roberts Street, Lower Level, Helena, MT 59601

### Meeting Goals

- Introduce our participation in the Strengthening Claims-Based Interpretations and Uses of Local and Large-Scale Science Assessments (SCILLSS) project.
- Provide an opportunity for the Office of Public Instruction's (OPI) state science partners to meet, get to know one another, and develop a shared understanding of their roles in informing state science initiatives and activities.
- Gather input from state partners regarding the intended purpose and use of the OPI science assessment in the context of the larger educational setting. *What is the purpose of the assessment, and what do we want to understand and communicate about students relative to our Montana Science Standards (2016)?*
- Develop a shared understanding of the OPI Theory of Action (ToA), including its purpose, components, and development process.
- Gather feedback from state partners to inform refinements to each of the components of the MT ToA.
- Discuss the OPI taskforce goals and next steps for both the state science assessment and SCILLSS.

### Monday, November 13

| | | |
|---|---|---|
| **12:30 p.m. – 1:00 p.m.** | **Welcome:** Check-in and orientation | All |
| **1:00 p.m. – 1:30 p.m.** | **Introductions:** Introduce state partners and vision for roles | Jessica Eilertson<br>Ashley McGrath |
| **1:30 p.m. – 2:00 p.m.** | **Assessment System Vision:** Discuss the intended purpose of the science assessment and score uses.<br>• *Upon high school graduation, what are our expectations for student outcomes relative to the expectations of Montana's Science Standards?*<br>• *What do we want to say about student performance?*<br>• *What information should be communicated to students, parents, teachers, administrators, media, and the state?*<br>• *How will we know our students are on track and making progress?* | Ashley McGrath |
| **2:00 p.m. – 2:15 p.m.** | **OPI Theory of Action (ToA) Overview:** Describe the ToA components and how they relate and inform one another | Erin Buchanan<br>Ashley McGrath |
| **2:15 p.m. – 4:45 p.m.** | **Review, revise, and discuss MT ToA components:**<br>• "Statewide Assessment Design System" (30 mins)<br>• "System Setting and Use" (30 mins)<br>• "Teacher Actions" (30 mins)<br>• "Student Actions" (30 mins)<br>• "Student Outcomes" and implementation goal (30 mins) | Ashley McGrath<br>Michelle McCarthy |
| **4:45 p.m. – 5:00 p.m.** | **Wrap Up/Questions and Next Steps**<br>• OPI taskforce goals<br>• Next steps for both state science assessment and SCILLSS | Jessica Eilertson<br>Liz Summers |

## Appendix D. Theory of Action Padlet Activity Results

### Student Outcomes (SO)

| MT's ToA statement for a re-envisioned science assessment system. | Corresponding guiding questions to consider the thinking behind the ToA statements. | November 13th Task Force Group Comments. |
|---|---|---|
| #1) Montana students are **critical consumers of information**, and can **apply** and **transfer** Montana Science Standards (2016) science and engineering practices in society, demonstrating **competitiveness in a global market**. | #1) Is it important for MT students to be critical consumers of information? Is transfer and application of this knowledge important? Do we care if students are competitive in a global market? | • (Group #7) Yes to all. It will translate to life skills and the work force, with the ultimate goal of college and career readiness. It is important for students to be able to think critically when finding new information because their generation will have access to more information than any generation before. And they need to be able to choose which sources to trust. Making informed decisions about health and the environment, and as future voters, they must be able to understand and evaluate scientific information. — ANONYMOUS<br>• Yes to all 3. Being a critical consumer of information and ability to transfer and apply knowledge go hand in hand with competition in a global market. This is also a key component of being community ready after K-12 education. — ANONYMOUS<br>• Yes, to all. Knowledge needs to be transferred and applied. Knowledge means nothing if you can't apply it. Critical thinking is critical to be competitive in the global market. — ANONYMOUS |

| MT's ToA statement for a re-envisioned science assessment system. | Corresponding guiding questions to consider the thinking behind the ToA statements. | November 13th Task Force Group Comments. |
|---|---|---|
| #2) Montana students have increased interest in, engagement with, and knowledge of science content and practices aligned to the Montana Science Standards (2016). | #2) Do we care if Montana students are interested in and/or engaged in their science education? | • Yes, this engagement is influenced by student exposure to science education early on in their educational experience. There is some question in the group about the relationship between engagement, interest and knowledge in relation to the standards and assessment. — ANONYMOUS<br>• Yes. Engagement provides deeper learning that is more meaningful to the student for future interests in science and awareness of the world around them (local, state, global). — ANONYMOUS<br>• Yes. Engagement means active participation, more inquiry less confirmation, autonomous interest, and relevant to the students. — ANONYMOUS |
| #3) As central focus of the ESSA state plan and for the science assessment system will be to yield score results which are timely and informative to stakeholders to help students make progress over time. | #3) Is it important that reports are timely and informative to stakeholders to help students make progress over time? Is it important for accountability that science achievement is part of the annual meaningful differentiation process? | • Yes, we think the feedback should be timely, specific, and made available online so that parents and all stakeholders have the appropriate access — ANONYMOUS<br>• This is a huge priority for the new assessment system. The current system does not provide this timely and informative information. It highlights the necessity of formative and interim assessments. We are not in support of constantly testing students, but identifying the balance of testing times and timely data for informing instructional practices. — ANONYMOUS<br>• Yes to all. The answer to the questions depends on whether we are looking at formative, interim, and summative. — ANONYMOUS |

| MT's ToA statement for a re-envisioned science assessment system. | Corresponding guiding questions to consider the thinking behind the ToA statements. | November 13th Task Force Group Comments. |
|---|---|---|
| #4) The Montana assessment system will provide student experiences that effectively integrating the three-dimensional Montana Science Standards (2016) in authentic, natural place-based phenomenon, and culturally-relevant ways. | #4) Is it important that the Montana assessment system is authentic meaning that there is stimuli that focuses on natural place-based phenomenon and culturally relevancy? | • Yes we have lots of resources, we are compelled by law, and it's the right thing to do for our students. — ANONYMOUS<br>• Yes, we see the most applicable integration occurring in the formative and interim assessments that are identified more on the local level — ANONYMOUS<br>• Yes, as long as it doesn't detract from the overall content. We must keep the cultural relevancy (IEFA) in our assessments. — ANONYMOUS |
| #5) Montana students are well prepared to enter post-secondary training and degree programs without remediation in Science content and experiences or extra expenses to complete certification or degrees. | #5) Is it important that our assessment system ensures our students are prepared for post-secondary training and low remediation? | • Yes, we should prioritize that the assessment system and the information and feedback from it, help us to know when students are successful and how they can find the support and take steps to be successful. The assessment should be informed by what students are expected to do at the post-secondary level. — ANONYMOUS<br>• Yes. If the assessment is more focused on skill and analysis and that post-secondary is equally applied to all things, not just college. — ANONYMOUS<br>• Yes, identifying the students' preparation in terms of multiple pathways for post-secondary training, Also, we want to see that inclusion of community ready. — ANONYMOUS |

**Student Actions (SA)**

| MT's ToA statement for a re-envisioned science assessment system. | Corresponding guiding questions to consider the thinking behind the ToA statements. | November 13th Task Force Group Comments. |
|---|---|---|
| #1) Montana students have increased interest in, **engagement** with, and knowledge of **Montana's Indian** tribes and their contributions to science. | #1) How can teachers help students engage in, have interest in IEFA and natural place-based phenomenon? Is this important to our curriculum and instructional effort? | • Teachers need support in understanding what IEFA resources are available to them (OPI and local resources, meaningful content and courses to support effective instruction). 3D lessons and units utilizing science and engineering practices will help students value the learning and engage with the phenomena or solutions to a problem. — ANONYMOUS<br>• Professional development needs to be provided to teachers in regard to integrating IEFA and place-based phenomenon. Trying to harness technology to open the walls of the classroom. — ANONYMOUS<br>• Creating learning experiences that are localized or placed based will lead into incorporation of IEFA and natural phenomenon. The standards have a strong emphasis on identifying phenomenon to engage students in their learning of science. IEFA and place-based instruction is a gateway to this emphasis. — ANONYMOUS |
| #2) Montana students are **invested** and understand how their commitment to science learning relates to high **school preparedness** and **progress toward a career pathway in STEM.** | #2) How can teachers help students make the connection with their investment in science to overall high school preparedness? Also, to advancing their skill sets for a career in STEM? Is this student buy-in important for an assessment system vision? | • Thoughtful, well-planned, meaningful instruction that instills curiosity, investigation. Opportunities for students to do the work and bring local professionals/organizations into the classroom, could help build interest in STEM fields. Student buy-in means they will put more effort in. If they care and understand what is for, it has meaning. When learning is relevant, effort will follow. Help parents know what's available to students. — ANONYMOUS<br>• Inter school/content dialogue. Integration of science into other content areas. Career connections integrated into contents. — ANONYMOUS<br>• Identifying and clarifying for students the pathways that are available and their connections to STEM skills is a priority. Teachers can help students make this connection by exposure to career exploration and integration of placed-based specialist who can support your instruction. |

| MT's ToA statement for a re-envisioned science assessment system. | Corresponding guiding questions to consider the thinking behind the ToA statements. | November 13th Task Force Group Comments. |
|---|---|---|
| | | In terms of student buy-in we see this happening with students taking the ACT and there are explicit outcomes for students taking this test that can support their buy in. Creating a similar buy in at the K-8 level is worth trying to identify what that could be for the student. — ANONYMOUS |
| #3) Montana students recognize the relationship between their science learning and the potential careers they may pursue in **STEM fields**. | #3) How can teachers help students make the connection with their investment in science that their time is well spent to help them with high career options? Is this student buy-in important for an assessment system vision? | • Yes. Students help develop assessments. — ANONYMOUS<br>• Make it relatable to potential career options. Yes, student buy-in is important. Formative assessment plays a role in identifying learning goals and what steps they will need to take. — ANONYMOUS |
| #4) Montana students take **ownership** in their science learning and are able to **establish** and **track their learning goals.** | #4) How can teachers help their students take ownership of their learning and establish and track their learning goals? Is this important for an assessment system vision? | • Teachers can help by sharing information with parents and having conversations about learning goals. An assessment system that includes technology and tools to share information<br>• with those who need it is necessary. Instant scoring and immediate feedback helps create buy-in. Student agency is key here. Helping students take more control in the daily and long-term learning. — ANONYMOUS<br>• Communicating to students their performance in a timely manner can be a motivating factor. However, this question is addressing students identifying their own learning goals and we question whether this should be a component of the assessment system in terms of the time and resources it would require. We think this is important within a school setting, but not a priority focus a state assessment system. — ANONYMOUS |

| MT's ToA statement for a re-envisioned science assessment system. | Corresponding guiding questions to consider the thinking behind the ToA statements. | November 13th Task Force Group Comments. |
|---|---|---|
| #5) Montana students are able to use **real time data** from the **formative process** to understand where they are in relation to the **learning goals** for the Montana Science Standards (2016). | #5) How can teachers help students elicit evidence of their learning to identify gaps and to strengthen their understanding? How can teachers help students be more data literate and better consumers of what this information means? What is the assessment system's role in this? | • Teachers can help students elicit evidence of their learning by clearly communicating learning targets that are understandable by the student. Also, providing students with time and the structure/tools to reflect on their learning. Within the formative component of the assessment system it would be advantageous to provide students with a report of their progress that is understandable at their level. — ANONYMOUS<br>• Use the tools available. Teachers need to have ongoing, real time access to data to help students. It would be great to have a Digital portfolio of student work connected to standards and assessment data. Pitch "variety of assessment strategies" as a key concept. Help teachers show students how their scores have changed over time so they can reflect. — ANONYMOUS<br>• If students know what proficiency looks like they can better identify the gaps. Ensuring you're using common language consistently. Use formative assessments often to gauge learning. Formative assessments are most important. — ANONYMOUS |
| #6) Montana students recognize relationships between their learning and community, and pursue additional science learning experiences and opportunities for economic, civic, and community development within and outside of the education system. | #6) How can access to better science help Montana students recognize their relationship to their community and help them pursue additional science experiences and opportunities for economic, civic, and community development? What is the assessment system's role in this? | • Incorporate relevant field trips and field experiences or invite professionals from the field in, job shadow, take part in externships/internships. — ANONYMOUS<br>• Utilize extension offices, local experts, use technology to video conference experts in. — ANONYMOUS<br>• Ideally an assessment system could have a role in this, however, with the limited resources we have for assessment in our state we question the likely hood of the assessment system being able to achieve this. There is an opportunity to the assessment system to push districts towards place-based instruction if the assessment authentically measures the practices outlined in the standards. — ANONYMOUS |

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| #7) Montana students will use the Montana Science Standards (2016) to increase knowledge, skills, and abilities essential for **solving human problems** and being **contributing** members with **21st Century Skills**. | #7) How can access to richer science standards help Montana students solve human problems and become contributing members to society with overall better 21st Century Skills? What is the assessment system's role in this? | • The assessment system's role in this to authentically measure the richer standards. Ultimately for some schools and districts they will teach what is measured. If the assessment system does not measure the ability to solve complex problems and contribute to society through problem solving then this type of instruction will not happen by design. There is some question among the group about combining solving human problems and having 212st century skills. — ANONYMOUS<br>• Connecting students to natural phenomenon within the state/community (news, local Audubon society, river cleanup, etc.). Stay focused on 3D learning. Richer standards will allow students to contribute to society to teach them how to "do" real science in a low risk environment. The assessment system will ensure that students are learning these standards in a 3D way. If students learn to think critically and evaluate evidence objectively, they will be able to analyze problems better and design creative and effective solutions. — ANONYMOUS |

**Teacher Actions (TA)**

| MT's ToA statement for a re-envisioned science assessment system. | Corresponding guiding questions to consider the thinking behind the ToA statements. | November 13th Task Force Group Comments. |
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| #1) Montana school administrators facilitate policy changes and access to resources that enable teachers to ensure that all students have the opportunities to experience individualized learning across the curriculum, particularly including STEM. | #1) How can local education agencies support teachers to help ensure students have opportunities to experience individualized learning across the curriculum, particularly including STEM? How does this relate to the statewide assessment vision? | • LEAs can provide teachers with time to plan in collaboration, time to participate in professional development, and necessary supports for implementation. School administrators need to be<br>• provided with training as well to fully understand the implementation. Budgetary, geography, and technology constraints need to be identified so you can create a plan of implementation despite those constraints. Providing LEAs with tools and resources to plan around the constraints while meeting the criteria. — ANONYMOUS<br>• High school - internships; elementary - field trips; community investigations; place-based learning. Programs like MPRES which provide job-embedded professional learning, mentorship, and opportunities for collaboration will help teachers provide these opportunities. Understand the range of options for delivering a meaningful assessment system - knowing the accreditation rules — ANONYMOUS<br>• More technology into the classroom. Giving teachers time to collaborate and integrate with colleagues. A need for a clear communication model for parents, students, and staff about the assessment model and the purpose behind it. — ANONYMOUS |
| #2) Montana school administrators provide the resources, professional development opportunities, and direction that support teachers in implementing a formative assessment process. | #2) How can local education agencies and leadership help teachers to cultivate student interest and engagement in STEM? How does this relate to the statewide assessment vision? | • LEAs can cultivate student interest by engaging community members and leaders, and parents through placed-based STEM curriculum. Cultivating relevance for students through clubs and extension of science skills in other fields can be a component of this as well. Creating an assessment vision that emphasizes application through placed-based relevance and then measuring |

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| | | student performance that utilizes those application skills. — ANONYMOUS<br>• Getting involved with the community; offering professional learning and ways to get local businesses and organizations involved (guest speakers, etc.); consider how to engage young children, particularly girls, in STEM and nurture throughout the grades so they don't lose interest. — ANONYMOUS<br>• STEM is a part of all science classes. School board should ensure that STEM is a part of all science classes. Teach (K-5) math and ELA through science (integration). — ANONYMOUS<br>• Professional development. Assessment targets and on the ground data about student performance help to guide this PD. Districts can also develop teacher leaders who can support their peers. — ANONYMOUS |
| #3) Montana school administrators create the structures and conditions that enable teachers to cultivate student interest and engagement in STEM. | #3) How can the state and districts help teachers provide aligned science instruction including the student cultural need and interest? Why does culture and interest matter to an assessment system? | • There must be a concerted effort and PR campaign to highlight the lack of science instruction taking place K-5 or K-6. There also must be guidance for districts on how to create vertical alignment K-12 in their science curriculum. The emphasis on instructional time focused on reading and math has created a situation where many students are not receiving science instruction K-5. — ANONYMOUS<br>• We will need to identify how to evaluate assessment for bias. Vetted lessons available to teachers that are aligned with specific standards, PD, and high-quality teacher collaboration would all promote buy-in and student interest. Have a place where MT science teachers can share lessons and resources (student work, videos, testimonials, etc.). Learning must be relevant (and take |

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| | | culture and interest into account) for student buy-in. — ANONYMOUS<br>• Culture increases student buy in. Testing must be culturally and geographically appropriate. — ANONYMOUS |
| #4) Montana teachers provide content to be aligned with assessment that meets Montana Science Standards (2016) including the meaningful integration of IEFA. | #4) How can the state and districts help teachers provide appropriate and relevant cultural connections to American Indians? Why does this IEFA connection matter to an assessment system? | • This is a mandate of the constitution and therefore must be a component of the assessment system. — ANONYMOUS<br>• State assessments need to align with standards, which incorporate IEFA. It's the law! — ANONYMOUS<br>• IEFA matters because it increases student buy in. Montana is multicultural. Additional resources, curriculum, and training to integrate. — ANONYMOUS |
| #5) Montana teachers cultivate student interest and engagement through the integration of science, technology, reading, engineering, arts, and mathematics (STREAM) and authentic learning experiences with stimulus specific to natural place-based phenomenon. | #5) How can the state and the districts help teachers have integrative methods for teaching science and for providing learning opportunities with scenario/stimuli that is specific to natural place-based phenomenon? Why is integration of other disciplines important to a system of science assessments? | • Broadening assessments to show the integrations and points of connection between disciplines. There are definite constraints with training teachers in supporting students to be better writers. — ANONYMOUS<br>• Lessons could be designed to integrate Math and ELA. Common Core aligns beautifully with NGSS, so we could have a library of lessons for teachers in different subject areas to collaborate. Assessment will have deeper meaning if it is integrated across<br>• content areas. — ANONYMOUS<br>• PD content and grade band specific. Integration is important because the world is integrated. If the assessment is integrated, integrated instruction will follow. — ANONYMOUS |

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| #6) Montana teachers guide students through a formative assessment process that tracks instruction through a clear and research-based progression of learning aligned to the essential knowledge, skills, and abilities of the Montana Science Standards (2016). | #6) How can the local education agencies help teachers with incorporating research proven formative assessment practices and coherent instruction? Who are the players in creating high quality, accessible, relevant, authentic, content-based, and culturally appropriate formative assessments? | • We also want to add that this could potentially be a place where higher education could support this assessment system through a continuing education component. — ANONYMOUS<br>• Through work with MEA-MFT, teachers, and school administrators; along with building the PAO repository, there needs to be a continual cycle of professional development for teachers around strategies and integration of formative assessment and reflective practice. — ANONYMOUS<br>• Assessment literacy modules will be helpful to bring into PD, Stem Teaching Tools, using resources, helping teachers evaluate alignment to the standards. Teachers are key players, but they must be able to collaborate, try them out, and reflect and revise, if needed. The state agency giving exemplars is important. — ANONYMOUS<br>• Students, community members, teaches, and business. — ANONYMOUS |
| #7) Through differentiated instruction, Montana teachers ensure that all students have the opportunity to experience personalized learning to meet the rigor of the Montana Science Standards (2016). | #7) How does the state and local education agencies help teachers with differentiated instruction to support students with attainment of the Montana Science Standards (2016)? How does the state and local education agencies help teachers with the rigor and cognitive complexities of the standards to ensure students have instructional opportunities to engage with complex reasoning before summative assessment? | • Support can be provided with differentiation through HUB course work, the formative component of the assessment system, and continued work with teacher preparation and continuing education. — ANONYMOUS<br>• Professional development supports (with collaboration opportunities) and model lessons provided by state and LEAs. The school board needs to know what their responsibility is to the students; they need to communicate it to schools. — ANONYMOUS<br>• NGSS is written for all students. Science practices is where it's at. Technology can help differentiate. Students are given the support |

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| | | to use the standards appropriately as well as accountability from administration. — ANONYMOUS |

**Setting System and Use (SSU)**

| MT's ToA statement for a re-envisioned science assessment system. | Corresponding guiding questions to consider the thinking behind the ToA statements. | November 13th Task Force Group Comments. |
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| #1) Montana's state and local science assessments measure the Montana Science Standards (2016) knowledge, skills, and abilities essential for **college and workforce readiness**. | #1) What does an assessment need to say about the knowledge, skills, abilities, college, community, and workforce readiness for students who are assessed in science? | • This assessment should guide students with work force or post-secondary and what skills students need for post-secondary/work force next steps/success. Assessment must assessment students' ability to DO the practices and apply the CCCs and extent of their knowledge. — ANONYMOUS<br>• Student are able to DO science. The assessment can perform the process of science and not just regurgitate content. — ANONYMOUS |
| #2) Montana teachers understand the purpose and intended score uses of Montana's large-scale assessment and appropriately use summative data from the assessment to inform instruction and learning. | #2) What professional development and implementation needs exist to ensure teachers understand the purpose, score uses and appropriate ways to use summative data to inform instruction? | • Assessment literacy PD, pathways of Learning Hub courses, literacy modules to translate into PD platform. Have teachers take sample test and delve into data. — ANONYMOUS |
| #3) Montana's science assessments maximize student engagement and participation through a technology-enhanced, adaptive assessment experience that is designed to minimize testing time and burden and produce student-level reports. | #3) Should the assessment be online? Why or Why not? Should the assessment be adaptive? Why or Why not? Should the student testing experience be embedded in problem sets or standalone items? What kind of student reports or information about students' needs to be made available? Will our summative science assessment be "where DOK 1 dies"? | • The assessment should be an online and adaptive, simple, stable system for statewide implementation. Teacher's observation of students engaged in the work has to be part of it (perf tasks, classroom-based assessments) — ANONYMOUS<br>• High school yes. Elementary, maybe not do to ability of young users. Equal accessibility computers. Assessments should be adaptive. Problem sets. What can they do in regard to the practices. Actionable next steps. YES, die DOK1! — ANONYMOUS |

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| #4) Montana's science assessments include score information that provides educators, students, and families with timely and actionable data on student performance and allow for regular adjustments to teaching and learning. | #4) What kinds of information are shared with educators, students, and families? When are results and score reports made available? What is actionable evidence to adjust teaching and learning? | • Parents need to know just after teachers to help with collaborative conversations and needed supports/learning goals/plans. Specific info about different concepts and skills would be helpful to communicate with parents and to inform district/school initiatives/needs. — ANONYMOUS<br>• Ask individual stakeholders. Results should be available ASAP. Teachers need to develop algorithm of actionable sets depending on data output. — ANONYMOUS |
| #5) Montana teachers are provided research-based resources, tools, and professional development to promote effective prioritization, integration, and delivery of the essential three-dimensional knowledge, skills, and abilities in the Montana Science Standards (2016). | #5) What supports, resources and avenues can the OPI make research-based tools available to teachers in order to promote the effective delivery of the Montana Science Standards (2016)? | • Learning Hub courses, OPI staff supporting questions and PD through consortiums and districts, newsletters, MPRES-like program, resources aligned to individual standards. Repository of lessons. — ANONYMOUS<br>• Repository of PD online as well as online PLC cohorts. — ANONYMOUS |
| #6) Montana's statewide assessment results connect with local assessments and instruction in a coherent, standards-based system. | #6) How can the statewide summative science test connect with local assessments? How can we ensure coherence and valid interpretations of students moving through the learning progressions? | *No responses recorded* |
| #7) Montana's stakeholders communicate and collaborate effectively to coordinate the alignment of curriculum, instruction, and assessment systems. | #7) How can the OPI provide support to message, collaborate, and to provide rich assessment literacy and data literacy training to the field? Who are the players and what is everyone's role? | *No responses recorded* |

**Statewide Assessment System Design (SASD)**

| MT's ToA statement for a re-envisioned science assessment system. | Corresponding guiding questions to consider the thinking behind the ToA statements. | November 13th Task Force Group Comments. |
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| #1) Montana is a **local-control state** and as such the OPI will work its **governing systems** and **partnerships** to implement changes that are reasonable and responsible given the unique educational circumstances of Montana's **K-12 accredited schools**. | #1) In order to comply with 10.56.101 (ARM) for administering assessments to our K-12 accredited schools, what local-control challenges does the OPI need to consider in moving forward to a new assessment? | • I think for secondary, we need to talk about which subject areas are going to be assessed. The Physical Science standards are very dense and almost require a full year of Physics and a full year of Chemistry. If we asses on all three subject areas, that would require three years of science, instead of two. Would we change the high school requirements, and mandate that students take Biology, Earth Science and Physical Science their freshman, sophomore and junior year? Would that also require us to have additional remediation classes? I think this needs to be discussed in detail with school districts representation every corner of MT because this is a difficult question. – ANONYMOUS<br>• **State Internal Partners**<br>o OPI has to pay for assessments for all accredited schools—both private and public.<br>o OPI spends $3.6 million each year on assessments; that is 100% federally funded.<br>o Is there a way to have districts who use interim/formative assessments redirect those funds? Why are the states paying for MAP, Renaissance Star, etc. that aren't aligned to the standards?<br>o Teachers believe that NWEA's MAP is the greatest thing to happen.<br>o Helena is hiring a specialist from out of state to help them.<br>o Longitudinal data is really important to teachers.<br>o **Ashley:** Will OPI pay for all accredited assessments? Is that set in stone? We would have more flexibility if that wasn't in there. |

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| | | ○ **Sue:** Why does only OPI pay for assessments?<br>○ **Colet:** ARM states that the state is responsible for the statewide assessments, but we only have federal dollars. If we change the rule, that would require an economic impact analysis.<br>○ **Jessica:** How does that parallel with the RFP? We won't know costs.<br>○ **Colet:** I recommend we do a RFI to get a sense of the playing field. We'd have to do an economic impact analysis to see how much it costs now, but we could estimate for making changes. We'd want to talk to Angela and Kirk since they can give a deep history of the rules. |
| | a) Should we assess at grades 5, 8, and 11? | • State OPI staff believes changing testing to grades 5 and 8 would be an easy transition, but that testing in grade 11 is the most contentious since state stakeholders feel that juniors are being over tested.<br>• They want to minimize the testing burden where possible e.g. math and ELA in grades 3-8 and 11.<br>• **Mary Ellen:** If you assess in grade 5, teachers might ignore science content in the lower grades.<br>• **Colet:** There's the possibility that they'll do "hurry up" science in grades 4-5 to do well on the assessment.<br>• **Michelle:** If we joined a consortium, which seems most logical, we'd have to test in 11 if that's what they were doing.<br>• **Jessica:** Maybe not, since with Smarter Balance you can administer in grades 9 or 10. There might be some flexibility. In a consortium, you designate the most important range and then everyone sticks to that. |

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| | | • **Michelle:** Maybe the test could be stage adaptive so that you can remove the grade 11 content to administer in 10.<br>• **Jessica:** There would be some validity questions and some issues around standard setting.<br>• **Colet:** If we want students to have personalized learning and want to know what the student knows and can do, then I think it makes the conversation about testing grades arbitrary. We have the formative and interim to be flexible so that we don't worry about only the tested grades.<br>• **Mary Ellen:** How are you educating the educators?<br>• **Colet:** We have HUB courses.<br>• **Jessica:** That's why we've convened this taskforce. We want them involved so that they go back to their districts and can be a resource. We can disseminate through newsletters, assessment conferences, webinars, etc.<br>• **Colet:** We're building a foundation of learning experiences and connecting to other states. As we move forward down the timeline the people involved can build excitement.<br>• **Mike:** You need a good PR campaign like the graduation matters campaign so it doesn't just seem like OPI is coming out with this.<br>• **Colet:** We need to pay attention to the PR and lessons learned from the Common Core experience. |
| | b) Who are the governing systems for any changes to ARM? What partnerships does the state need to build to implement changes to ARM? | • There's an OPI policy for creating or changing an administrative rule.<br>• First you deal with the accreditation standards, then negotiated rule making.<br>• The OPI rule-making committee is the same group as the taskforce (lawyers, internal staff). |

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| | | • Externally when you want to propose rules you go to external writing teams and negotiate rule making. Any change to administrative rules has to go through the whole process of adopting rules beginning with OPI.<br>• Any changes to ARM must go through the Board of Public Education.<br>• **Ashley:** Does this work start now for 2020 then?<br>• **Colet:** If you pull up the timeline for standards revisions posted that would be a good guide if you wanted to start the process. It takes about 2 years to go through the process. Rules have to go to an interim committee before the legislative session convenes. They have to look at economic impact.<br>• **Jessica:** Who are our resources? Who do we talk to?<br>• **Colet:** You can start with me and Elsie.<br>• **Jessica:** Do you want to engage in an administrative rule process? When do we involve CTE?<br>• **Colet:** You need to involve Linda and the Board of Public Education. From my experiences with the content standards revisions, you have to consider the time and staff involved, public notice and meetings, which goes through the legal department. There's an expense to do this. When you buy public notices, that costs money. The external writing team and negotiated rule making costs money. |

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| #2) Montana's science assessments are accessible, equitable, and culturally relevant to the widest range of students possible, **including Montana's American Indians,** through the application of UDL principles. | #2) To comply with the OPI's 10.56.101 accessibility and equity standards and to ensure that are tests are culturally relevant and sensitive to American Indian culture, what UDL principles and efforts should be made to ensure these assessments are equitable 10.53.102? | *No responses recorded* |
| #3) Montana in efforts with its work with its **governing systems (**policymakers and legislators) to review and revise the Administration Rules governing Montana's statewide assessments to reflect the implementation of the Montana Science Standards (2016). | #3) In collaboration with the governing systems (policymakers and legislators) what changes are needed in ARM to support a new assessment measuring the Montana Science Standards (2016)? | *No responses recorded* |

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| #4) Funding for the Montana Science Standards (2016) aligned science assessment will be **funded solely** by the Office of Public Instruction's (OPI) federal grant. | #4) With the OPI's budget for science assessment, will a high quality three-dimensional science assessment be feasible? | • State partners discussed the 5 options for science assessments.<br>• Consortiums like MSAA and Smarter have experts and have money to have states access resources that we don't have staff for.<br>• Buying an off-the-shelf assessment tends to be work because it has to be reviewed for Indian content and meaningful connections.<br>• There will be have augmentation to an off-the-shelf assessment.<br>• It has to be inclusive of science from native experiences and defining what Indian Education for All is. We have an opportunity to do it well if we can.<br>• There might be something to glean from IEFA states to see how they are dealing with it. Some potential partners would be SD, ND, WI, ME, etc.<br>• MT does not develop their own assessment because of costs, but if they had the time, money, and capacity it would be ideal. |
| #5) Montana will identify partners to fully implement its summative assessment system for science by the spring of 2020 and work toward building a | #5) What should the OPI's plan for having an operational summative test be? | • Montana has work to support formative and large-scale summative assessments, what about interim?<br>• **Sue:** It's incumbent is it not? How can we offer a summative without interim?<br>• The summative test is not supposed to give actionable data. |

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| comprehensive system of assessments by the spring of 2024. | a) What should the timeline be? What should the timeline be for a balanced assessment system? | • **Colet:** I think there's opportunity to help trustees understand what their responsibilities are. They have specific responsibilities for having a balanced system of assessments to help them place students. There are other statutes. When you get into the administrative rules there's this whole system of assessment for state content standards. We have help in the statutes and administrative rules. How are we going to make connections to help districts in service of local control to move toward a standards-based system?<br>• **Michelle**: How do we switch or present that what we have is more powerful? They believe MAP is aligned to standards and it isn't (assessment literacy); it's a message they don't want to hear. |
| #6) Montana will set Every Student Succeeds Act (ESSA) goals for STEM. The OPI's ESSA state plan will be revised as new science measure are made available. | #6) Presently, the OPI Every Student Succeeds Act (ESSA) plan includes the CRT-Science for grades 4 and 8 as a STEM fifth indicator. Should the OPI consider changes to the plan before 2020? Is the CRT-Science assessment appropriate as a STEM indicator? | *No responses recorded* |
| #7) Montana's assessment system for science will be geared to have predictive and placement potential to help students participate in meaningful and relevant measures to gauge their progress toward learning Montana Science Standards (2016). | #7) The OPI assesses grade 11 students in the ACT in part for the predictive and meaningful college entrance properties of the test for this population, should the OPI science assessment also be predictive? | *No responses recorded* |

**Overall Questions (Overall)**

| Overall Theory of Action Questions | Personal Space to Draft Comments |
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| #1) Are the ToA statements clear? | *No responses recorded* |
| #2) Is the ToA language accessible, relevant, and reflective of our state? | *No responses recorded* |
| #3) Is there any redundancy? If so, can this be collapsed? | *No responses recorded* |
| #4) Do any sections need to be parsed out? | *No responses recorded* |
| #5) Is there anything missing? | *No responses recorded* |
| #6) How is the final draft messaged to the field? | • We can use the ToA as leverage and a talking point.<br>• **Colet:** Go to the School Board and have it integrated in their communications and professional development. |
| #7) How do we stage this component and subcomponents to match the needs of the field? | *No responses recorded* |