



High School Science

At least one of the following artifacts must be discussed during the evaluation: peer feedback, student feedback, lesson plans, student work or parent feedback.

QUALITY STANDARD 1

Teachers demonstrate mastery of and pedagogical expertise in the content they teach.

The elementary teacher is an expert in literacy and mathematics and is knowledgeable in all other content areas he or she teaches. The secondary teacher has knowledge of literacy and mathematics and is an expert in his or her content endorsement area.

ELEMENT A: Teachers provide instruction that is aligned with the Colorado Academic Standards, their District's organized plan of instruction; and the individual needs of their students.

Examples of artifacts that may be used as evidence to support practice:

- Use of district curriculum frameworks (CAS/GVC/NGSS) in planning
- Lesson plans aligned to curriculum frameworks
- Learning targets/objectives aligned to curriculum frameworks (CAS/GVC/NGSS)
- Learning targets/objectives communicated to students
- Differentiation
- Scaffolding
- Curriculum audits
- Adjustments in instruction
- Participation in PLT/PLC/departmental teams
- Horizontal and vertical alignment in PLT/PLC/departmental teams
- Deliver approved curriculum
- Collaboration regarding curriculum is evident

ELEMENT B: Teachers demonstrate knowledge of student literacy development in reading, writing, speaking and listening.

Examples of artifacts that may be used as evidence to support practice:

- Use of common core reading and writing standards in science
- Students read, write, speak about what they read, and listen during lessons
- Interactive word wall
- Use thinking maps as a mid-range tool (move from thinking/collecting info to synthesis for speaking/writing)
- Scaffolding
- Differentiated texts or student choice
- Readings used in class are relevant or interesting to students
- Students argue from evidence/write evidence-based claims

- Supplemental readings
- Student annotation of readings (paper or digital)
- Direct instruction and modeling on annotation
- Teacher models literacy skills
- Use of WIDA standards for ELLs
- Students research and obtain information to answer critical, essential higher level questions
- AVID strategies
- Assessment data shows student improvement in literacy skills
- Teacher asks higher level questions/essential questions

ELEMENT C: Teachers demonstrate knowledge of mathematics and understand how to promote student development in numbers and operations, algebra, geometry and measurement and data analysis and probability.

Examples of artifacts that may be used as evidence to support practice:

- Teacher discusses math
- Inclusion of science practices #4-5 from NGSS Practices (analyzing and interpreting data; using mathematics and computational thinking)
- Use of common language: interdisciplinary connections made to math
- Working with math department to use the same language to describe functions (rate/slope, validity, direct/indirect, etc)
- Making connections to mathematical discipline (“this is the same thing you saw in math...”)
- Teacher asks questions leading to mathematical connections/patterns/concepts
- Teacher shows explicit connections to math and encourages students to make connections to math in science
- Teacher aligns lessons to the Common Core SMP (standard math practices)
- Teacher models solving problems using math
- Teacher emphasizes importance of learning math content and skills by making math an important part of course
- Math is required to understand a scientific concept
- Evidence of using math in class (posters on walls, problems solved on board, student samples of work, equation sheets on student desks, technology, lab quests)
- Lab calculations
- Use of calculators
- Teacher makes connections of problem solving using mathematics in the “real-world”
- Teacher makes explicit the relationship between mathematical skills and concepts and scientific relationships
- Positive classroom atmosphere while students are doing math indicates teacher promotes and encourages students to make explicit math connections
- Laboratory experiments or activities address mathematical concepts and thinking

ELEMENT D: Teachers demonstrate knowledge of the content, central concepts, tools of inquiry, appropriate evidence-based instructional practices and specialized character of the disciplines being taught.

Examples of artifacts that may be used as evidence to support practice:

- Differentiation
- Scaffolding
- “I do, we do, you do” Gradual release model
- Using models to explain content
- Use of the NGSS Science Practices
- Direct instruction and demonstrations on laboratory procedures
- Use of inquiry, variety inquiry methods (continuum from teacher led to student centered)
- Students generate questions, procedures, conclusions independently
- Students are engaged, not “lost”
- Students follow directions, are aware of procedures in classroom
- When students are asked, they can articulate what they are doing
- Minimal teacher clarification
- Content expressed in multiple modalities
- Variety of instructional strategies
 - Exit ticket
 - TPS (think-pair-share)
 - clickers
 - laboratory experiments
 - simulations
 - demonstrations
 - video
 - discussion
 - collaboration structure
 - K-W-L
 - POGILs
 - assessment (formative and summative)
 - activating background knowledge
 - case studies

ELEMENT E: Teachers develop lessons that reflect the interconnectedness of content areas/disciplines.

Examples of artifacts that may be used as evidence to support practice:

- Using word origin, root words to show connections between vocabulary in other disciplines
- Use of common cross-curricular language (CER, math terms, thinking maps, annotations)
- Use of “Big Ideas”
- Teacher makes connections to life, physical, and earth science disciplines (verbal, written)
- Teacher makes connections to other disciplines or real-world connections (discussion, activities)
- Students make a product (presentation/brochure/etc) that makes connections to other disciplines
- Readings connect to other disciplines, real-world connections
- Student work samples (annotations, including print or digital) that have trans-disciplinary connections

- Common language *between* other departments, and *within* science disciplines
- AVID strategies
- Students make a product for audience other than science classroom teacher (RAFT)
- Students are using academic vocabulary (written or verbal)
- Vocabulary flashcards/science term cards (prefix/suffix/root word) that have the ability to be connected across curriculums
- Teacher questioning regarding academic vocabulary, numeracy, literacy

ELEMENT F: Teachers make instruction and content relevant to students and take actions to connect students' background and contextual knowledge with new information being taught.

Examples of artifacts that may be used as evidence to support practice:

- Teacher activates background knowledge, asks students to make connections
 - K-W-L
 - discussion
 - pre-tests
- Materials are relevant and students are engaged
- Students make personal connections to content (verbal/written)
- Essential questions engage students
- Compacting (accelerated learning based on background knowledge)
- Centers/stations (students rotate through different learning experiences)
- Projects with options (presentations, papers)
- Student inventory to guide instruction
- Student inventories to form groups, decide on project topics
- Student choice for product, process, and content
- Students working on different tasks (differentiated instruction, stations)
- Scaffolded instruction
- Remediation/enrichment activities based on student assessment
- Catch and release (adjustment of instruction based on formative assessment)
- Equity (CARE/AVID strategies)
- POGIL group roles (process analyst, spokesperson, quality control, facilitator)

QUALITY STANDARD II

Teachers establish a safe, inclusive and respectful learning environment for a diverse population of students.

ELEMENT A: Teachers foster a predictable learning environment in the classroom in each student has a positive, nurturing relationship with caring adults and peers.

Examples of artifacts that may be used as evidence to support practice:

- SSRRs (systems, structures, rituals, and routines) are in place
- Classroom is organized and students know where to find materials
- Students demonstrate respect for one another, teacher through language and actions
- Students understand expectations - students are on-task, common language has been established in classroom for structures (“turn and talk” - students know what to do)

- Visible agenda/syllabus posted
- Learning targets: students know expectations, predictable routine
- Teacher shows empathy and concern for students
- Teacher dignifies student errors/addresses misconceptions
- Students feel comfortable enough to participate, and contributions are valued
- Evidence of students helping students
- Collaboration-students work cooperatively
- Students express verbally that teacher has a caring and nurturing relationship with students
- Teacher addresses student problem behavior appropriately, positive discipline behavior
- Rules/expectations are posted in classroom, enforced with consistency
- Teacher welcomes students
- Social contracts (students develop and agree upon classroom norms)
- PBS (positive behavior supports)

ELEMENT B: Teachers demonstrate a commitment to and respect for diversity, while working toward common goals as a community and as a country.

Examples of artifacts that may be used as evidence to support practice:

- Learning targets/objectives posted
- Students demonstrate respect for one another, teacher through language and actions
- Students understand expectations, teacher follows through with consistency
- Teacher shows empathy and concern for students
- Teacher dignifies student errors/addresses misconceptions
- Students feel comfortable enough to participate, and contributions are valued
- Evidence of students helping students
- Collaboration-students work cooperatively
- Students express verbally that teacher has a caring and nurturing relationship with students
- Teacher addresses student problem behavior appropriately, consistently
- Rules/expectations are posted in classroom, enforced with consistency
- AVID/CARE strategies
- Courageous conversations
- Culturally relevant instruction
- Activating background knowledge
- Learning is relevant and accessible to all students
- Student choice: create opportunities for students to share their backgrounds and diverse family structures
- Teacher behavior engages students in learning

ELEMENT C: Teachers engage students as individuals with unique interests and strengths.

Examples of artifacts that may be used as evidence to support practice:

- Genuine student engagement
- Uses results of student interest inventories
- Acknowledgement of student accomplishments
- Wait time

- Five Es (engage, explore, explain, elaborate, expand)- STEM
- Teacher provides genuine praise (written, verbal, other)
- Levels of questions embedded within lesson
- All students participate in activities (verbal, written)
- Processing strategies

ELEMENT D: Teachers adapt their teaching for the benefit of all students, including those with special needs across a range of ability levels.

Examples of artifacts that may be used as evidence to support practice:

- Understanding of all students with 504s and IEPs, ELLs adherence to those learning plans
- Differentiated instruction
- Multi-modal instruction
- Remediation and enrichment opportunities
- Systems allow for all students to be heard every class
- Formative assessment
- Feedback provided to students
- Redirection
- Collaboration with colleagues to implement best practices for students
- Attend IEP, 504, and other student meetings
- Monitoring progress
- All students are held to rigorous academic standards
- AVID strategies
- Uses support systems
- Giving students opportunities to edit and re-submit work

ELEMENT E: Teachers provide proactive, clear and constructive feedback to families about students' progress and work collaboratively with the families and significant adults in the lives of their students.

Examples of artifacts that may be used as evidence to support practice:

- Initiate, schedules and attends parent conferences
- Emails and calls home
- Teacher receives emails and phone calls from parents/students
- Schoology: student work is available online
- Powerschool: updates gradebook regularly
- Invite parents to presentations to give feedback
- Parent visits
- Individual student conferences
- Concussion feedback
- Work with colleagues regarding specific students (mental health, deans, nurse, counselors, coaches)

ELEMENT F: Teachers create a learning environment characterized by acceptable student

behavior, efficient use of time and appropriate intervention strategies.

Examples of artifacts that may be used as evidence to support practice:

- Clearly established procedures are in place, students follow procedures
- Teacher supports and follows school rules/student expectations
- Smooth transitions
- Consistent consequences
- Bell to bell instruction
- Safety rules posted, safety instruction for specific laboratory activities
- Goggles and other safety protocols followed
- Materials are organized, students know where to find materials and can easily get what they need
- Students keep the room organized and tidy
- Teacher gives students time to clean up
- Efficient protocols in place

QUALITY STANDARD III

Teachers plan and deliver effective instruction and create an environment that facilitates learning for their students.

ELEMENT A: Teachers demonstrate knowledge of current developmental science, the ways in which learning takes place and the appropriate levels of intellectual, social and emotional development of their students.

Examples of artifacts that may be used as evidence to support practice:

- Differentiated instruction
- Formative assessment, adjustments to instruction based on results
- Participation in PLT/PLC/collaborative groups
- Utilization of teacher coaches (if applicable)
- Participation in professional development
- Teacher stays current on best practices and educational research, brings in evidence, certificates, articles
- Implementation of current best practices for science instruction (for example, CERs)
- Tuning protocol: collaborative work results in improved lesson, based on analysis of student work
- Participation in lesson study, peer observations
- Intentional grouping for peer collaboration
- Describe students in “can do” terms rather than what they cannot do

ELEMENT B: Teachers plan and consistently deliver instruction that draws on results of student assessments, is aligned to academic standards and advances students’ levels of content knowledge and skills.

Examples of artifacts that may be used as evidence to support practice:

- Teacher utilizes assessment data

- Clearly defined learning targets for every lesson
- Learning targets are assessed
- Plan-->teach-->monitor-->adjust
- Formative assessment: data drives changes in instruction
- Students take AP exams, SAT IIs, based on teacher encouragement
- Assigning peer mentors/buddies
- “No opt out”
- All students are expected to participate, method in place to ensure all students contribute (random caller, popsicle sticks)
- Exit tickets
- Monitoring progress
- Feedback provided to students
- Encouragement and praise (verbal, written)
- Remediation and enrichment opportunities

ELEMENT C: Teachers demonstrate a rich knowledge of current research on effective instructional practices to meet the developmental and academic needs of their students.

Examples of artifacts that may be used as evidence to support practice:

- Analysis of RAD data
- Using Marzano strategies, thinking maps, CERs, science practices
- Differentiation
- Progress monitoring
- Implementation of current best practices for science instruction (for example, CERs)
- Tuning protocol: collaborative work results in improved lesson, based on analysis of student work

ELEMENT D: Teachers thoughtfully integrate and utilize appropriate available technology in their instruction to maximize student learning.

Examples of artifacts that may be used as evidence to support practice:

- Chromebooks
- Schoology/COLE 3.0
 - online testing
 - discussions
- Probes/lab quests
- pHET and other simulations
- Students stay on task while using technology
- Clickers
- Doc cams
- Projectors
- Apps (remind 101, etc)
- Using phones for educational purposes
- Using technology to create products
- SMARTboards (?)
- Flipped classrooms (video tutorials at home)
- Online courses
- Webquests

- GoogleDocs: collaborative workspace
- Scrible
- Library databases
- Easybib

ELEMENT E: Teachers establish and communicate high expectations for all students and plan instruction that helps students develop critical thinking and problem solving skills.

Examples of artifacts that may be used as evidence to support practice:

- High level of student engagement
- Teacher redirection when needed
- No opt out
- Grades are updated
- Differentiation
- Higher level questioning, no giving answers
- Student centered activities
- Use of science and engineering practices
- Lessons reflect use of differing levels of thinking (ex. Costa's questions, Bloom's, etc)
- Scaffolding
- Direct instruction in problem solving
- Teacher models problem solving
- Students take AP exams, SAT IIs, based on teacher encouragement

ELEMENT F: Teachers provide students with opportunities to work in teams and develop leadership qualities.

Examples of artifacts that may be used as evidence to support practice:

- Every voice is heard every day in the classroom
- All students are engaged in all activities, procedures in place (random calling, popsicle sticks, group roles, etc)
- Collaborative groups and group roles
- Flexible grouping: system in place for assigning students to groups based on objectives
- Multiple grouping opportunities depending on learning objectives: partners, larger groups
- Jigsaw/expert groups
- Student products varied: verbal, written, visual, etc.

ELEMENT G: Teachers communicate effectively, making learning objectives clear and providing appropriate models of language.

Examples of artifacts that may be used as evidence to support practice:

- Clear and concise communication with students
- Communication can be verbal, written, visual and easily accessible (unit plan, syllabus: paper, digital, posted on board)

- Students communicate in a variety of ways (written, verbal, partners, small groups)
- Time for students to record homework in planners
- Provide time for students to develop academic language, verbal and written
- Time provided for students to practice communication (partner share, small group share, presentations in class)
- Teachers model effective communication (verbal, written, body language)
- Teacher speaks clearly, faces the classroom, uses accessible language that is understood by students

ELEMENT H: Teachers use appropriate methods to assess what each student has learned, including formal and informal assessments, and use results to plan future instruction.

Examples of artifacts that may be used as evidence to support practice:

- Direct, email, or phone communication with specific actions assigned
- Students complete their own progress monitoring
- Students self-reflect on learning targets
- Students do test corrections
- Students use rubrics for self-assessment
- Variety of assessment methods (Schoology, clickers, etc)
- Assessments align with learning targets
- Feedback is timely and specific to give students comments on their progress
- Teachers collaborate to determine category weighting for same course
- Multiple categories for weighting in gradebook
- Teachers use assessments to adjust instruction
- Teacher provides students opportunity to revise/edit based on feedback