West Virginia COVID-19 2020:
From Outbreak to Recovery Advisory Council

Grades 6 - 12
Instruction and Learning Considerations and Supports for Re-Entry

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Introduction

This document is designed to assist districts, administrators, and educators with all phases of the West Virginia COVID-19 2020 reentry planning process. Please note that this ***is a living, iterative, document*** that will be updated regularly to best benefit those associated with the grade six through grade twelve education community in West Virginia.

Section 1: Equity, Structure and Logistics

School may look vastly different in the coming year, possibly with most students attending school two or three days a week and doing the rest of their learning at home. At school, desks may be spaced apart to discourage touching. Some classrooms may be left vacant while schools may put on hold activities that will cram lots of children together.

Schools could consider bringing back vulnerable students first for more one-on-one help or scheduling more days of in-person instruction for them. Students with disabilities, or those whose families rely on schools for food or other assistance, could attend in-person three days a week, while more highly resourced students with access to technology at home could attend two days a week.

Reopening schools cannot be a one size fits all scenario. It may vary from region to region, county to county, or school to school. Below are several options and considerations that may surface during the return in the fall; a combination of these options or others are also viable. Keep in mind that this has been and continues to be a fluid situation and there may be times that schools have to stop, regroup and consider additional alternatives.

Equity

The 2020 COVID-19 pandemic has required educators to rethink how to ensure all children have access to equitable learning opportunities. Considerations should be defined for those students who cannot attend daily and require virtual learning.

Many families with school-aged children lack access to computing devices and broadband. Existing research only partially characterizes these obstacles. A survey of high school students taking the ACT found that one in seven lived in homes with only one computing device for the whole family (Moore et al., 2018). Pew Research (2019) shows that only 56% of adults living in households earning less than $30,000 per year have access to broadband. To our knowledge, there is no survey data that would allow us to more precisely measure readiness for distance learning in a pandemic; we do not know what fraction of households with school-aged children have broadband access and a device for each child. By all indications, however, many school-aged children and their families, especially in rural and urban areas, face serious limits to accessing online learning.

Structure

Logistical Considerations

- Restructuring the School Day
  - Half Days - half the student population goes to school in the morning and half goes in the afternoon.
  - Cohorts – Small groups of students stay together all day while teachers go from class to class.
  - One Course at a time – Instead of traveling from course to course throughout the school day students would complete one course at a time over a few weeks, before moving to the next course.
  - Full-time Virtual Instruction – Students would be enrolled in the county school system but would attend virtually either through the WV Virtual School or through a County selected vendor and/or Learning Management System.
  - Block Scheduling - Return to block scheduling in order to get courses completed in one semester and to allow students to focus on fewer subjects at one time.
  - Additional resources for scheduling can be found *here* (Mansfield ISD, 2014)
- Restructuring the School Week
  Research demonstrates that while students returning from an extended school closure initially experience some learning loss, returning to a stable learning environment has been shown to decrease the persistence of these losses within a year or two. However, learning loss tends to persist when students experience a chaotic reentry to learning (Allensworth & Schwartz, 2020). As schools begin planning for the fall semester, consider how each of the following structures may support a more stable reentry to learning.
  - Alternating days – Students are placed into two groups, for example Group A and Group B. Group A would attend school Monday and Tuesday. Wednesday would be used for cleaning, teacher training teacher planning. Group B would then attend Thursday and Friday.
  - Alternating days - Students would be placed in two groups with an alternating number of days in attendance each week. During one week the first group would attend 3 days while the second group attended 2 days and then the next week they would switch numbers of days.
  - Alternating weeks for two groups of students.

- Alternating grades - Each grade level attends a different day of the week utilizing various teachers while others work with virtual learners.

- Transitions
  - Transition grades such as 5th grade to 6th grade or 8th grade to 9th grade would attend school a full week prior to other students returning.
  - Transition grades would possibly attend three days a week instead of two when utilizing alternating day plans.
- Learning Plans
  - Full-time learning with no internet access. Those students would need to be on a digital-based delivery system and the school might need to set up weekly face-to-face meetings between the family and an assigned teacher.
  - Full-time virtual learning with reliable technology.
  - Cross-Curricular - a teacher or group of teachers' "shares" a larger group of students, but each teacher actually stays with part of the group in their classroom and students can "attend" video-broadcast mini-lessons being given by teachers in other rooms. If all students in this arrangement were working on cross-curricular projects, this could ultimately be an improvement over the kind of traditional instruction they had before.
  - Competency Based Instruction allows students to work through courses at their own place. Teachers would keep office hours to address individualized instruction needs. Students could be assigned to attend at minimum of one day a week face to face or virtual instruction.

Family Engagement and Communication

- Teachers will need to focus on relationships first and content second. In this model, students have someone they can reach out to immediately for support, which is critical when their world is upside down. Having a strong, supportive relationship with at least one adult has shown to increase students' resilience and accelerate students' learning (Allensworth & Schwartz, 2020).
- Work with Local School Improvement Councils to provide stakeholder input.
- A clear line of communication with students and families is a very crucial part of keeping the changes in education positive.
- Host trainings on virtual learning for families.

Student Engagement Timeline Considerations

The following recommendations and guidelines are presented as suggestions for counties to consider regarding minimum and maximum times of engagement by each student during blended or virtual learning models.

Grade Level	Minimum	Maximum	Recommended Length of Sustained Attention
Pre-K	20 minutes/day	60 minutes/day	3-5 minutes
K	30 minutes/day	90 minutes/day	3-5 minutes
1-2	45 minutes/day	90 minutes/day	5-10 minutes
3-5	60 minutes/day	120 minutes/day	10-15 minutes
6-8	Class: 15 minutes/day Total: 90 minutes/day	Class: 25 minutes/day Total: 150 minutes/day	1 subject area or class*
9-12	Class: 20 minutes/day Total: 120 minutes/day	Class: 30 minutes/day Total: 180 minutes/day	1 subject area or class*

**In grades 6-12, rather than dividing daily minutes between courses or subjects, consider dedicating the minutes to a specific subject area or class per day such as mathematics on Mondays or social studies on Thursdays.*

Section 2: Grade 6-12 Instruction, Interventions and Assessments

Whether instruction is delivered face-to-face, virtually or through a blended format, it is necessary to conduct a close examination of the content standards for each grade level and content area in order to determine how best to provide instruction for all students. A *recent study* forecasts that students will enter school in fall 2020 *with approximately 30% learning loss in literacy and 50% learning loss in mathematics*. Left unchecked, this academic setback could derail the futures of students who were previously on grade level—and would be disastrous for students who were already behind. This is a new and unique challenge for educators that will require a new solution and a new mindset. The typical approach to remediation—providing students with work aligned to standards from previous grades—won't come close to catching students up and will likely compound the problem (Allensworth & Scwartz, 2020). The following considerations for instruction, intervention and assessment address the critical need for addressing the achievement gap to ensure all students are successful.

Instruction

Vertical Teaming

Vertical teaming occurs when teachers across a progression of grade levels engage in open, consistent communication to ensure that students receive an intentionally designed, step-by-step curriculum that scaffolds their mastery of content standards (*Schlosser*, 2015). While it is always best practice to communicate and collaborate vertically, the absence of face-to-face instruction for most of the fourth quarter this year makes it imperative that grade-level teachers in a school/county engage in conversation through which they compile a list of skills and corresponding content standards that were not sufficiently addressed or re-emphasized during the 2019-20 school year. As schedules and calendars are designed, time for vertical teaming should be purposefully provided and protected. (see *Appendix A*)

Critical Prerequisite Skills

The West Virginia College- and Career-Readiness Standards (WVCCRS) support a vertical progression of learning that is comprehensive and rigorous. The skills targeted in each standard are developed over the course of a students' K-12 education with each year's skill development building upon prior years. This vertical progression means that *every standard* plays a role in the development of critical prerequisite skills for future years.

- *Appendix B – Critical Prerequisite Skills ELA*
- *Appendix C – Math Critical Prerequisite Skills*
- *Appendix D – Science Critical Prerequisite Skills*
- *Appendix E – Physical Education Considerations*
- *Appendix F – Social Studies Critical Prerequisite Skills*
- *Appendix G – Arts Education Considerations*
- *Appendix H – Driver Education Considerations*

Instructional Teams

Instructional teams are a vital piece of ensuring that ***all*** students have access to high-quality instruction in whatever delivery format or schedule is selected by a school/county (Voogt et al., 2016). In most cases, schools/counties will need multiple instructional teams. For example, educators who teach the same grade level will need to collaborate to set grade-level expectations and schedules for instruction and assessments and to coordinate community building efforts for students in the grade they teach. Similarly, educators who teach the same content area or discipline will need to collaborate to ensure that students receive the best instruction for that discipline; for instance, science teachers may collaborate to determine the best way to conduct lab experiences in a virtual setting, in a block, or in whatever schedule/format the school has chosen for instructional delivery. As schedules and calendars are designed, time for instructional team collaboration should be purposefully provided and protected. To ensure that all students receive high-quality, standards-aligned instruction, school and county instructional teams may want to consider instructional approaches that maximize students' practice and application of the skills and content found in grade-level standards. Evidence-based practices include:

- Project Based Learning
- Competency Based Learning/Instruction
- Interdisciplinary Instruction (e.g. STEM, Literacy across the Content Areas)

Virtual Instruction

Many county school districts are currently exploring their virtual school options for their students this year. As a reminder, there are four options to consider as you select your county's virtual school program.

- Option #1 – West Virginia Virtual School and WVVS Contracted Teacher, Platform and Curriculum
- Option #2 - County Employed Teacher and WVVS Curriculum/Contracted Curriculum
- Option #3 - County Employed Teacher and County Curriculum
- Option #4 - County Contracted Provider (supplying both instructor and curriculum.)

Counties and schools may offer as few or as many of these options to best meet their student needs. All four options may be reimbursed through West Virginia's state aid formula.

Many counties have inquired about the costs associated with Option 1. West Virginia Virtual School and WVVS Contracted Teacher, Platform and Curriculum. They are as follows:

- ***Option 1.*** The West Virginia Department of Education has lowered the cost of West Virginia Virtual School (WVVS) for 2020-21 school year. Please see the full time and part time options for WVVS defined below:

  - ***WV Virtual School (WVVS) Full-time Options****
    - *Tuition fees for public school students enrolled full-time in the WVVS for the 2020-21 school year will be $600 per semester. Fees will be paid by the local school system and reimbursed via state aid formula.*
    - *Tuition fees for private and home school students enrolled full-time in the WVVS for the 2020-21 school year will be $600 per semester. Fees will be paid by the local school system and reimbursed via state aid formula.*

    **If the county school system chooses to use the WV Learns platform/WVVS curriculum and supply the teacher, their costs will be $160 annually.*

- ***WV Virtual School (WVVS) Part-time Options***
  - *Public students attending a brick and mortar school who need a virtual course due to scheduling conflicts or course availability, may take two courses each semester at no cost.*
  - *Private and home school students may also take two courses each semester at no cost by registering as a part-time student at the local school.*

If you have questions regarding Option 1 West Virginia Virtual School Program, please email Gloria Burdette at *gkburdet@k12.wv.us*. If you have questions regarding Options 2, 3 or 4, please email Joey Wiseman at *rjwisema@k12.wv.us* or Monica DellaMea at *mdellamea@k12.wv.us* or Jan Barth at *jan.barth@k12.wv.us*.

Dual and Embedded Credit

As schedules and delivery formats will likely look differently than usual, high schools should discuss the following considerations to ensure that all students have access to *post-secondary credit and embedded credit opportunities*:

- ***Dual credit*** - Dual Credit continues to be an option to provide counties flexibility in student scheduling and course offerings. As school administrators begin to plan for the fall semester, they should reach out to each institution of higher education their school has agreements with for up-to-date guidance and policies for dual credit courses.
- ***Embedded credit*** – Many high schools utilize embedded credit (incorporation of content standards from one credit bearing course into another "host" course) to provide students with flexible scheduling. As comprehensive high schools design their instructional programming, they may want to consider how offering embedded credit may increase flexibility in the school's schedule as well as in students' schedules. Similarly, high schools that collaborate with a CTE Center (single or multicounty) may also want to consider how offering embedded credit factors into scheduling and flexibility for schools and students. To learn more about embedded credit policy, review WVBE Policy 2510 as well as the current state-approved embedded offerings.

Multi-tiered System of Support

The West Virginia Tiered System of Supports (WVTSS) framework is a state-wide initiative that suggests flexible use of resources to provide relevant academic, behavioral and mental health support to enhance learning for all students. WVTSS is characterized by a seamless system of high-quality instructional practices allowing all students to sustain significant progress, whether they are considered at-risk, exceeding grade-level expectations, or at any point along the continuum. The WVDE has made an intentional shift in terminology to a "multi-tiered system" to emphasize the integration of academics, behavior and mental health as uniformly critical to student success. WVTSS focuses on the cohesive system of support, rather than just the interventions. Vertical teams, instructional teams and individual educators should utilize the WVTSS framework to ensure that all students receive the high-quality instructions and support they need to be successful.

Multi-tiered Systems of Support One Pager (June 2020)

Types of Assessment

When students receive high quality, actionable feedback about their progress toward learning outcomes, they are able to make informed decisions concerning their short and long-term learning goals and the strategies and tools they use to meet those goals. According to Allensworth & Schwartz (2020), "Systems that track attendance, assignment completion, and grades strengthen schools' ability to individualize services and match specific interventions to the needs of different students so students don't fall behind in their courses" (p.4). A balanced approach to assessment includes formative, interim and diagnostic tools as well as other forms of assessment.

- ***Formative*** – Formative assessment is the deliberate daily process used by teachers and students ***during*** instruction that provides actionable feedback used to adjust ongoing teaching and learning to improve students' achievement of intended learning outcomes. Depending on the schedule and format selected for instruction, educators and students may need to consider new methods of communicating and gathering evidence of daily student progress. For example, in a virtual learning environment, educators may need to utilize online polls or phone conferencing where they have used informal observation in the past. To learn more about formative assessment, review *the WVDE Formative Assessment Toolkit*.
- ***Interim & Diagnostic*** – Interim and diagnostic assessments provide evidence of student learning progress at specific points in the instructional process. As students return to schools in the fall, schools who serve students in grades 3-8 will have available to them many resources and tools that can assist them in determining the strengths and weakness of the West Virginia College- and- Career- Readiness Standards in English language arts and math. The Office of Assessment is providing a brief list and description of resources available for your students and teachers to utilize once the Covid-19 pandemic has ended. These resources not only prepare students for the WVGSA in the Spring of 2021 but also provide information and reporting that educators can use to make informed decisions about instructional practices.

Fall 2020 Assessments and Resources for Students in Grades 3-8

English Language Arts and Math
Computer Adaptive Comprehensive Interim Assessments (CA-CIAs) - Computer adaptive, quasi-secure comprehensive interim assessments that replace the computer adaptive, highly secure (Policy 2340 training required) Classroom Benchmark Assessments (CBAs), have the same test blueprint as the WVGSA and report group and individual student data on content standard mastery.
Fixed Form Comprehensive Interim Assessments (FF-CIAs) - Fixed form, quasi-secure comprehensive interim assessments that have the same test blueprint as the WVGSA and report group and individual student data on content standard mastery. While the fixed form test does not provide the preferred level of student performance data as the CA-CIA, it can be accessed in the Teacher Item Previewer and offers item level data.
Interim Module Assessments (IMAs) - Short module tests that assess clusters of related content standards and measure student progress throughout the year.
West Virginia Diagnostic Assessments (DIAs) - Short tests, written by West Virginia educators, which assess clusters of related content standards and measure student progress throughout the year written.

Science
Science Interim Assessments (SIAs) - Grade-band, cluster tests that assess clusters of related content standards in Elementary and Middle School Science and measure student progress throughout the year.

Resources
Teacher Item Previewer - Allows teachers to preview and review the FF-CIA, IMAs, DIAs and SIAs using a computer and/or projector.
Interim Resources Website - Resources page for teachers with documents, guides and information related to the WVGSA and interim assessments.
MetaMetrics Minutes – Short PowerPoints and Quick Guides providing directions for using the MetaMetrics Hub. The Hub contains resources available to assist educators, students and parents. Because students will return in the fall with differing instructional needs, these resources can be of great benefit for differentiating student instruction and assignments.

- ***Other*** – Additional tools for identifying students' needs may include county or school selected diagnostic, interim, or benchmarking assessments.

Instructional Considerations

- ***Devices*** – In order for blended and/or virtual instruction to occur, students will need access to devices. County school districts will need to make decisions regarding programs such as 1:1 initiatives and/or surveying families to determine the prevalence of appropriate devices in student homes.
- ***Staffing*** – As the potential methods of instruction become more and more possible, staffing will need to respond. For example, if full-time virtual instruction occurs in schools, the school will retain the FTE, but the teacher will teach courses online. If students are scheduled to come to school on a different weekly schedule, staff many find themselves teaching multiple grade levels on different days to cover all the days of student instruction.
- ***Access*** – All students need access to the instructional materials. Should a district increase the use of the Office 365 platform, it may become imperative to give younger students access to their Office365 username and password. Traditionally, these were given out in the later grades.
- ***Accessibility*** – Regardless of the format of instruction, the instruction needs to be accessible to all students. All students, including those with exceptionalities, must have their educational needs met.
- ***Security*** - Microsoft Office 365 products provided by the West Virginia Department of Education are compliant with child privacy and protection laws such as *FERPA*, *HIPAA*, *COPPA* and *CIPA*. Please note that if teachers utilize other platforms, there is no guarantee that the platform is in compliance. Serious questions arise depending on the age of the user and who created the account to access the platform. Please work with local legal counsel to review applicable laws before using any technology with students.

- ***Interventions*** – As the return to learning occurs, county school districts need to be mindful of the many interventions required for students. In this situation, interventions may also include:
  - Working with families to allow for families to understand best practices related to virtual learning.
  - West Virginia Tiered System of Supports (WVTSS) framework provides leadership regarding the myriad of interventions available to and required by students.
  - High-dosage tutoring directly connected to content which helps students succeed in their current coursework while meaningfully closing gaps in student achievement (Allensworth &Schwartz, 2020).
  - Extended learning opportunities in single subjects delivered by select teachers to provide students in homogenous ability groups with targeted, small-group instruction that accelerates learning (Allensworth & Schwartz, 2020).

Section 3: Grades 6-12 Professional Learning

Prior to return to learning, training related to design of instruction needs to be considered. This training may include videos, just-in-time vignettes, short courses, Teams meetings and WVLearns courses (e.g. delivery model, sequencing, student engagement, communication/collaboration, formative assessment).

Delivering Virtual Instruction *(General and Content Specific)*
Training specific to blended, virtual, and/or no-Internet delivery models may be of assistance to teachers and other educators.

Designing Virtual Instruction
Training specific to delivery models, sequencing of instruction, student engagement, communication/collaboration and formative assessment may be of assistance to teachers and other educators.

Content Specific Training
Training specific to delivery grades 6-12 content in terms of labs, physical activity, performances and modeling may be of assistance to teachers and other educators. Content specific resources (e.g. *math4life*) are also available.

Virtual Learning for Instructional Coaches and Administrators
Training specific to scheduling, parental communication and support, instructional support may be of assistance to instructional coaches and administrators.

Professional Learning for Students and Families
Training specific to supporting positive mental health for teens feeling isolated, addressing stress, supporting children as online learning and keeping children active and motivated may be of assistance to parents and students.

WV Learns Resources
WVLearns Information: *https://wvde.state.wv.us/elearning/*
WVDE registration page: *https://wveis.k12.wv.us/registration/*
WVLearns course location: *http://wvlearns.k12.wv.us*

Section 4: Extended Learning Opportunities

The primary acquisition of knowledge and skills is through instruction or study outside of the traditional classroom. Students may elect to participate in extended learning opportunities and may receive elective credit when approved by their County Board of Education (§18-2-7e) *https://legiscan.com/WV/text/SB750/id/2168128/West_Virginia-2020-SB750-Enrolled.html*.

- The county boards of education shall adopt an alternative educational opportunities policy that recognizes learning opportunities outside of the traditional classroom and grants elective course credit.
- Work with entities, including, but not limited to, nonprofit organizations, afterschool programs, businesses and trade associations. Many may have an interest in offering programs outside of the traditional classroom that are attractive to students and contain educational value.
- The county boards of education shall have the authority to create an application process and approve or deny an application for an alternative educational program: *Provided*, That if the application is denied, the county board shall provide a detailed explanation of the reasons for its denial and suggest ways to improve the application that will assist its more favorable view by the county board.
- Virtual Options Beyond K-12.
  - The county boards of education shall have the authority to audit approved alternative educational programs at any time.
- Additional Resources for Extended Learning Opportunities:
  - *https://beyondclassroom.org/*
  - *https://www.ncsl.org/research/education/elo-briefs.aspx*
  - *http://www.nea.org/assets/docs/HE/mf_PB04_ExtendedLearning.pdf*

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Appendix A – Vertical Teaming

Thinking Horizontally, Working Vertically
A Standards-Focused Vertical Teaming Exercise for Educators

Introduction:
This exercise can be utilized by educators across grade levels to help ensure standards-based content that was missed due to the COVID-19 pandemic can be included as part of the instructional process during the upcoming school year.

Note: West Virginia content standards are end of grade level expectations for what students should know, understand, and be able to do.

Directions for middle and secondary school educators:

- Complete the exercise indicated on the next page for each content area as directed by your principal or county.
- You may need one sheet for English language arts, one for mathematics, and one for other content areas as directed.
- Share this completed exercise with the educator(s) who teach the next grade level.
- You will receive a completed exercise from the grade level that precedes the one you teach to give you a better understanding of the standards from that grade level you will need to address at the beginning of the year as part of your instruction.
- Engage in dialogue with the educators who teach the grades above and below the grade level you teach regarding strategies, techniques, and general information needed to ensure missing standards are taught.

Grade Level:	Educator Name:
Content Area:	

Which standards had not yet been introduced prior to the March 13, 2020 school closing?

Which strategies, techniques, or resources might be used by educators in the next grade level to effectively integrate missing standards into their content? (i.e., What works best for me to teach these missing standards?)

This exercise will be shared with_____ as part of a vertical teaming discussion about the standards that had not yet been introduced prior to the March 13, 2020 school closure.

Appendix B – ELA Critical Prerequisite Skills

English Language Arts – Critical Prerequisite Skills

Introduction

The West Virginia College- and Career-Readiness Standards for English Language Arts (WVCCRS for ELA) support a vertical progression of learning that is comprehensive and rigorous. The skills targeted in each standard are developed over the course of a students' K-12 education with each year's skill development building upon prior years. This vertical progression means that every standard plays a role in the development of critical prerequisite skills for the following year.

The West Virginia College- and Career-Readiness Standards are end-of-grade-level expectations for what students should know, understand and be able to do. The WVCCRS for ELA are designed with a strong emphasis on integrated literacy development with each of the 41 standards being addressed multiple times throughout the year using different texts and topics for various purposes, audiences, and tasks. Given that the standards are not designed to be taught from 1 to 41 in order, classroom educators have carefully selected and crafted curriculum for English language arts based on their instructional philosophy and the needs of their students. This diverse range of philosophies and student needs has an impact on when grade-level skills and concepts are introduced and then re-emphasized throughout the year. As a result, it would be beneficial for grade-level teachers in a school/county to engage in a conversation through which they compile a list of skills and corresponding content standards that will not be sufficiently addressed or re-emphasized during this school year. For example, teachers of Grade 6 English language arts could compile a list of skills/standards that they would like to have had more time to address to greater depth with some or all students and share the list with Grade 7 teachers. This student gap analysis will support Grade 7 teachers as they prepare for possible tiered instruction that may be required at the beginning of the school year.

How to Use this Resource

The following discussion guide can be used to support individual reflection and to enhance collaborative conversations between educators regarding students' progression through the grade-level standards and the gaps that may be present during the next academic year.

Support students progressing to the next grade level and their new teacher by:

- examining the critical pre-requisite skills in the grade level you teach compared to those in the next grade level
- reflecting on how each skill was addressed during the year and how students were progressing with each skill
- answering the reflection questions and sharing data and insights with students' teacher(s) in the next grade level
- engaging in collaborative conversations with your students' teacher(s) in the next grade level regarding students' progress with critical skills and specific standards and sharing strategies and techniques for accelerating students' literacy achievement

Support new students by:

- examining the critical pre-requisite skills in the grade level you teach compared to those in the grade level before it
- reflecting on the nuances you see between the two grade levels and the strategies and techniques you use to support students' progression with skills and standards each year
- answering the reflection questions and gathering data about incoming students' skill progression, engagement levels, and interests from their previous teacher(s) as well as from students, families, and other sources of student data
- engaging in collaborative conversations with students' teacher(s) in the previous grade level regarding students' progress with critical skills and specific standards and sharing strategies and techniques for accelerating students' literacy achievement

Questions to Guide Reflection and Discussion

Beginning of the Year Self-Reflection Questions:

- What nuances do I see between the critical skills in the grade level I teach and the critical skills of the previous grade level?
- What specific standards or clusters of standards create the nuances in critical skills between these grade levels? *(See ELA Standards Progression document for support)*
- How do I normally tier instruction to bridge the increased rigor and complexity between the standards in grade level I teach and the standards in the previous grade level? *(See Support for College- and Career-Readiness Standards document for support)*
- What strategies and scaffolds do I already know that I can draw on to support students who may have fallen behind?
- What additional information/data do I need about students' strengths and weaknesses?

On-Going Self-Reflection Questions

Additional Supports for Reflection and Collaborative Conversations

- *English Language Arts Standards Progressions*
- *Support for College- and Career-Readiness Standards (Grades 6-8)*

Grade 5 to Grade 6

The WVCCRS for ELA support a vertical progression of learning meaning that every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the nuances between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' literacy development.

In grade 5, instructional time supports students' development of the following critical skills:	In grade 6, instructional time supports students' development of the following critical skills:
» Quoting accurately from a text when explaining what the text says and when drawing inferences; providing a summary of the text. » Determining the theme or central idea of a text and explaining how key ideas and details provide support or development. » Comparing and contrasting the structures of multiple literary and informational texts. » Analyzing differences in point of view and how point of view influences how events are described. » Producing clear and coherent writing and speaking appropriate to task, purpose, and audience. » Using a variety of sentences for meaning, reader/listener interest, and style. » Demonstrating understanding of conjunctions, prepositions, interjections, and verb tenses. » Conducting short research projects that use several sources; provide a list of sources.	» Citing textual evidence to support analysis of what text says as well as inferences drawn from the text; summarizing text objectively. » Analyzing the development of theme or central idea, characters/individuals, and events/plot by examining elements such as sequencing, word/phrase meaning, and point of view or purpose. » Evaluating arguments and specific claims and distinguishing claims that are supported by reasons and evidence from claims that are not. » Presenting claims and findings to others orally and in writing that sequence ideas logically, accentuate central ideas or themes, and vary sentence patterns for meaning, reader/listener interest, and style while maintaining consistency in style and tone. » Assessing the credibility of sources and gathering relevant information from them. » Avoiding plagiarism and providing basic bibliographic information for sources.

Significant Shifts in Emphasis Between Programmatic Levels: Elementary to Middle Grades
» From recalling content or quoting content to citing textual evidence. » From determining theme/central idea to explaining and then analyzing how they are developed in text. » From explaining how a text is structured to analyzing the impact of specific text structure » From composing opinion pieces and supporting a point of view with reasons to composing arguments and supporting claims with clear reasons and relevant evidence. » From recalling information and referring to resources to gathering relevant information and avoiding plagiarism using standard format for citation and style.

Grade 6 to Grade 7

The WVCCRS for ELA support a vertical progression of learning meaning that every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the nuances between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' literacy development.

In grade 6, instructional time supports students' development of the following critical skills:	**In grade 7, instructional time supports students' development of the following critical skills:**
» Analyzing the development of theme or central idea, characters/individuals, and events/plot by examining elements such as sequencing, word/phrase meaning, and point of view or purpose. » Analyzing how a particular sentence, chapter, scene, etc… fits into the overall structure of a text and contributes to the development of the ideas. » Evaluating arguments and specific claims and distinguishing claims that are supported by reasons and evidence from claims that are not. » Presenting claims and findings to others orally and in writing that sequence ideas logically, accentuate central ideas or themes, and vary sentence patterns for meaning, reader/listener interest, and style while maintaining consistency in style and tone. » Assessing the credibility of sources and gathering relevant information from them. » Avoiding plagiarism and *providing basic bibliographic information* for sources.	» Analyzing the development of theme and central idea by examining how elements of *literary text* interact and how individuals, events, and ideas interact in *informational text*. » Analyzing how craft and structure contribute to the development of narrator's voice, characters' point of view, author's purpose, and overall meaning of a text. » Tracing and evaluating arguments and claims, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims. » Presenting claims and findings precisely and concisely orally and in writing; emphasizing main points and focusing on how well purpose and audience have been addressed. » Using search terms effectively to gather relevant information; assessing credibility of sources and accuracy of information. » Avoiding plagiarism and *using a standard format for citations (MLA or APA).*

Grade 6 through 8: Critical Skills Continually Refined through Study of Increasingly Complex Texts
» Citing textual evidence; increasing in quality and strength of support each year » Determining theme and central idea and their development using increasingly complex texts » Summarizing text objectively; increasing in clarity and quality each year » Writing informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. » Writing arguments to support claims with clear reasons and relevant evidence. » Writing narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences. » Engaging effectively in a range of collaborative discussions with diverse partners on grade level topics, texts, and issues, building on others' ideas and expressing ideas clearly. » Avoiding plagiarism; increasing in accurate application of standard format for citation and style from Grade 7 through Grade 12 (MLA or APA).

Grade 7 to Grade 8

The WVCCRS for ELA support a vertical progression of learning meaning that every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the nuances between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' literacy development.

In grade 7, instructional time supports students' development of the following critical skills:	In grade 8, instructional time supports students' development of the following critical skills:
» Analyzing the development of theme and central idea by examining how elements of literary text interact and how individuals, events, and ideas interact in informational text. » Analyzing how craft and structure contribute to the development of point of view, purpose, and overall meaning of a text. » Tracing and evaluating arguments and claims, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims. » Presenting claims and findings precisely and concisely orally and in writing; emphasizing main points and focusing on how well purpose and audience have been addressed. » Using search terms effectively to gather relevant information from credible, accurate sources.	» Analyzing the development of theme and central idea by examining how structure or formatting, point of view, and/or interactions between individuals, events, and ideas contribute to the overall meaning of a text. » Analyzing how authors shape their presentations by emphasizing certain evidence or interpretations and assessing whether reasoning is sound and evidence is relevant to support claims. » Analyzing the purpose of information presented in diverse media and evaluate the motives behind its presentation; citing evidence to support analysis. » Presenting findings and claims orally and in writing using precise word choices, smooth transitions, and sentence variation; emphasizing key points with sound reasoning and evidence; adapting language to the audience and the formality of the setting; responding to questions and comments with relevant observations and ideas. » Using search terms effectively to gather relevant information from multiple sources checking them for accuracy and credibility.

Grade 6 through 8: Critical Skills Continually Refined through Study of Increasingly Complex Texts

- » Citing textual evidence; increasing in quality and strength of support each year
- » Determining theme and central idea and their development using increasingly complex texts
- » Summarizing text objectively; increasing in clarity and quality each year
- » Writing informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- » Writing arguments to support claims with clear reasons and relevant evidence.
- » Writing narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.
- » Engaging effectively in a range of collaborative discussions with diverse partners on grade level topics, texts, and issues, building on others' ideas and expressing ideas clearly.
- » Avoiding plagiarism; increasing in accurate application of standard format for citation and style from Grade 7 through Grade 12 (MLA or APA).

Grade 8 to Grade 9

The WVCCRS for ELA support a vertical progression of learning meaning that every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the nuances between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' literacy development.

In grade 8, instructional time supports students' development of the following critical skills:	In grade 9, instructional time supports students' development of the following critical skills:
» Analyzing the development of theme and central idea by examining how structure or formatting, point of view, and/or interactions between individuals, events, and ideas contribute to the overall meaning of a text. » Analyzing how authors shape their presentations by emphasizing certain evidence or interpretations and assessing whether reasoning is sound and evidence is relevant to support claims. » Analyzing the purpose of information presented in diverse media and evaluate the motives behind its presentation; citing evidence to support analysis. » Presenting findings and claims orally and in writing using precise word choices, smooth transitions, and sentence variation; emphasizing key points with sound reasoning and evidence; adapting language to the audience and the formality of the setting; responding to questions and comments with relevant observations and ideas. » Using search terms effectively to gather relevant information from multiple sources checking them for accuracy and credibility.	» Analyzing how authors develop complex characters, individuals, or events, represent cultural experiences, transform source material, and/or build upon themes and concepts in influential and significant historical and literary works. » Analyzing influential U.S. documents of historical and literary significance, including how they address related themes and concepts. » Assessing claims and arguments; make judgments about whether evidence is trustworthy and reasoning is logical. » Presenting findings and claims orally and in writing, building on others' ideas and expressing ideas clearly and persuasively; read and research material under study explicitly drawing on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas. » Using advanced searches effectively to gather relevant information from authoritative sources; assess the usefulness of each source; integrate information into the text selectively to maintain the flow of ideas.

Grade 6 through 8: Critical Skills Continually Refined through Study of Increasingly Complex Texts

- » Citing textual evidence; increasing in quality and strength of support each year
- » Determining theme and central idea and their development using increasingly complex texts
- » Summarizing text objectively; increasing in clarity and quality each year
- » Writing informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- » Writing arguments to support claims with clear reasons and relevant evidence.
- » Writing narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.
- » Engaging effectively in a range of collaborative discussions with diverse partners on grade level topics, texts, and issues, building on others' ideas and expressing ideas clearly.
- » Avoiding plagiarism; increasing in accurate application of standard format for citation and style from Grade 7 through Grade 12 (MLA or APA).

Grade 9 to Grade 10

The WVCCRS for ELA support a vertical progression of learning meaning that every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the nuances between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' literacy development.

In grade 9, instructional time supports students' development of the following critical skills:	In grade 10, instructional time supports students' development of the following critical skills:
» Analyzing how authors develop complex characters, individuals, or events, represent cultural experiences, transform source material, and/or build upon themes and concepts in influential and significant historical and literary works. » Analyzing *influential U.S. documents* of historical and literary significance, including how they address related themes and concepts. » Assessing claims and arguments; make judgments about whether evidence is trustworthy and reasoning is logical. » Presenting findings and claims orally and in writing, building on others' ideas and expressing ideas clearly and persuasively; read and research material under study explicitly drawing on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas. » Using advanced searches effectively to gather relevant information from authoritative sources; assess the usefulness of each source; integrate information into the text selectively to maintain the flow of ideas.	» Analyze how the author unfolds an analysis or series of complex ideas or events in informational texts, including the order in which the points are made, how they are developed, and how they interact. » Analyzing and defend how an author draws on or transforms source material; including how they address related themes and content. » Analyzing a variety of literary texts reflecting the cultural experience and *point of view of authors from outside the United States*. » Analyze and defend in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of an informational text. » Using complex ideas, strong evidence, descriptive details, and cohesive structure to express a point of view for a variety of purposes, tasks, and audiences. » Working with peers to set rules for democratic, collegial discussions and decision-making. » Using advanced searches effectively to gather relevant information from authoritative sources; assess the usefulness of each source; integrate information into the text selectively to maintain the flow of ideas.

Grades 9 through 12: Critical Skills Continually Refined through Study of Increasingly Complex Texts
» Citing textual evidence; increasing in quality and strength of support each year » Determining theme and central idea and their development using increasingly complex texts » Summarizing text objectively; increasing in clarity and quality each year » Writing informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. » Writing arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. » Writing narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. » Initiating and effectively participating in a range of collaborative discussions with diverse partners on grade level topics, texts, and issues, building on others' ideas and expressing ideas clearly and persuasively. » Avoiding plagiarism; increasing in accurate application of standard format for citation and style from Grade 7 through Grade 12 (MLA or APA).

Grade 10 to Grade 11

The WVCCRS for ELA support a vertical progression of learning meaning that every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the nuances between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' literacy development.

In grade 10, instructional time supports students' development of the following critical skills:	**In grade 11, instructional time supports students' development of the following critical skills:**
» Analyzing how an author's choices concerning how to structure a literary text, *order events* within it, and *manipulate time* contribute to its overall structure and create *such effects as mystery, tension, or surprise*. » Analyze how the author unfolds an analysis or series of complex ideas or events in informational texts, including the order in which the points are made, how they are developed, and how they interact. » Analyzing and defend how an author draws on or transforms source material; including how they address related themes and content. » Analyzing a variety of literary texts reflecting the cultural experience and *point of view of authors from outside the United States*. » Analyze and defend in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of an informational text. » Using complex ideas, strong evidence, descriptive details, and cohesive structure to express a point of view for a variety of purposes, tasks, and audiences. » Working with peers to set rules for democratic, collegial discussions and decision-making. » Using advanced searches effectively to gather relevant information from authoritative sources; assess the usefulness of each source; integrate information into the text selectively to maintain the flow of ideas.	» Analyzing how an author's choices concerning how to *structure specific parts* of a text contribute to its overall structure *and meaning as well as its aesthetic impact*. » Analyzing how two or more themes or central ideas in a text develop over the course of the text, including how they interact and build on one another to produce a complex account. » Analyzing how word choices and phrasing convey meaning and add complexity to works of historical and modern authors. » Analyzing cases in which grasping a point of view requires distinguishing what is directly stated in a literary text from what is really meant. » Demonstrating knowledge of eighteenth-, nineteenth-, and early-twentieth-century foundational works of American literature, including how two or more literary texts from the same period treat similar themes or topics. » Using technology to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. » Evaluating a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used; give thoughtful feedback and accept feedback graciously. » Making strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

Grade 9 through 12: Critical Skills Continually Refined through Study of Increasingly Complex Texts
» Citing textual evidence; increasing in quality and strength of support each year » Determining theme and central idea and their development using increasingly complex texts » Summarizing text objectively; increasing in clarity and quality each year » Writing informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. » Writing arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. » Writing narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. » Initiating and effectively participating in a range of collaborative discussions with diverse partners on grade level topics, texts, and issues, building on others' ideas and expressing ideas clearly and persuasively. » Avoiding plagiarism; increasing in accurate application of standard format for citation and style from Grade 7 through Grade 12 (MLA or APA).

Grade 11 to Grade 12

The WVCCRS for ELA support a vertical progression of learning meaning that every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the nuances between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' literacy development. The WVCCRS for ELA sets the expectation that students are nearly college- and career- ready as they enter their senior year of high school. Due to this high expectation, the nuances between grade 11 and grade 12 are incredibly subtle.

In grade 11, instructional time supports students' development of the following critical skills:	**In addition to continuing to develop the skills highlighted in 11th grade, in grade 12 instructional time supports students' development of the following critical skills:**
» Analyzing how an author's choices concerning how to *structure specific parts* of a text contribute to its overall structure *and meaning as well as its aesthetic impact*. » Analyzing how two or more themes or central ideas in a text develop over the course of the text, including how they interact and build on one another to produce a complex account. » Analyzing how word choices and phrasing convey meaning and add complexity to works of historical and modern authors. » Analyzing cases in which grasping a point of view requires distinguishing what is directly stated in a literary text from what is really meant. » Demonstrating knowledge of eighteenth-, nineteenth-, and early-twentieth-century foundational works of American literature, including how two or more literary texts from the same period treat similar themes or topics. » Using technology to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. » Evaluating a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used; give thoughtful feedback and accept feedback graciously. » Making strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.	» Citing strong and thorough textual evidence from the text and a variety of other sources to support analysis of what the text says, including determining where and why the text leaves matters uncertain. » Providing an objective and critical analysis of literary and informational texts. » Analyzing seventeenth-, eighteenth-, and nineteenth-century foundational U.S. informational documents of historical and literary significance for their themes, purposes, rhetorical features, and current relevancy. » Analyzing multiple interpretations of a story, drama, or poem, critically evaluating how each version interprets the source text. » Synthesizing multiple sources of information presented in different media or formats as well as in words in order to address a question or solve a problem.

Grades 9 through 12: Critical Skills Continually Refined through Study of Increasingly Complex Texts
» Citing textual evidence; increasing in quality and strength of support each year » Determining theme and central idea and their development using increasingly complex texts » Summarizing text objectively; increasing in clarity and quality each year » Writing informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. » Writing arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. » Writing narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. » Initiating and effectively participating in a range of collaborative discussions with diverse partners on grade level topics, texts, and issues, building on others' ideas and expressing ideas clearly and persuasively. » Avoiding plagiarism; increasing in accurate application of standard format for citation and style from Grade 7 through Grade 12 (MLA or APA).

Appendix C – Math Critical Prerequisite Skills

Introduction

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning that is comprehensive, rigorous, and non-redundant. The skills targeted in each standard are developed over the course of a students' K-12 education with each year's skill development building upon prior years. This vertical progression means that every standard plays a role in the development of critical prerequisite skills for the following year. Instruction in an accelerated format will require the compaction of content, not the deletion of content.

The West Virginia College- and Career-Readiness Standards are end-of-grade-level expectations for what students should know, understand and be able to do. Counties have carefully selected instructional materials for mathematics based on their instructional philosophy. These differing philosophies have an impact on the order in which grade-level concepts are introduced throughout the year. As a result, it would be beneficial for grade-level teachers in a school/county to engage in a conversation through which they compile a list of content standards that that they would like to have had more time to address to greater depth with some or all students and share the list with teachers of the next grade-level or course. For example, teachers of Grade 6 mathematics could compile a list of standards not adequately addressed to inform the teachers of Grade 7 mathematics. This student gap analysis will support teachers of Grade 7 as they prepare to address gaps in content knowledge in their courses.

How to Use this Resource

The following discussion guide can be used to support individual reflection and to enhance collaborative conversations between educators regarding students' progression through the grade-level standards and the gaps that may be present during the next academic year.

Examples of Use

Support students progressing to the next grade level and their new teacher by:

- examining the critical pre-requisite skills in the grade level you teach compared to those in the *next* grade level
- reflecting on how each skill was addressed during the year and how students were progressing with each skill
- answering the reflection questions and sharing data and insights with students' teacher(s) in the next grade level
- engaging in collaborative conversations with your students' teacher(s) in the next grade level regarding students' progress with critical skills and specific standards and sharing strategies and techniques for accelerating students' development of conceptual understanding and procedural fluency

Support your new students by:

- examining the critical pre-requisite skills in the grade level you teach compared to those in the grade level *before* it
- reflecting on the vertical progression between the mathematics concepts in the two grade levels and the strategies and techniques you use to support students' progression of skills and understanding of the standards each year

- answering the reflection questions and gathering data about incoming students' skill progression, engagement levels, and interests from their previous teacher(s) as well as from students, families, and other sources of student data
- engaging in collaborative conversations with students' teacher(s) in the previous grade level regarding students' progress with critical skills and specific standards and sharing strategies and techniques for accelerating students' mathematical understanding and strengthening their mathematical skills and fluency.

Questions to Guide Reflection and Discussion

Beginning of the Year Self-Reflection Questions:
• What vertical progression do I see between the critical skills in the grade level I teach and the critical skills of the previous grade level?
• What specific standards or clusters of standards highlight the vertical progression in critical skills between these grade levels? (*See the West Virginia Educators' Guides for support*)
• How do I normally tier instruction to bridge the increased rigor and complexity between the standards in grade level I teach and the standards in the previous grade level? (*See Support for College- and Career-Readiness Standards document for support*)
• What strategies and scaffolds do I already know that I can draw on to support students who may have fallen behind?
• What additional information/data do I need about students' strengths and weaknesses?
Beginning of the Year Collaborative Conversation Starters

Additional Supports for Reflection and Collaborative Conversations are available on the WVDE math4life website. At this site, the Educators' tab provides access to Grade Specific Resources (*https://wvde.us/math4life/educators/grade-specific-resources/*) where the following documents are housed:

- West Virginia College- and Career-Readiness Standards
  - Mathematics content standards
  - State policy for instruction
- Support for College- and Career-Readiness Standards
  - Allows students to work towards mastery of grade level and course content standards while working at individual ability levels
  - Identifies the pre-requisite and enabling skills for each standard
- West Virginia Educators' Guides for Mathematics
  - Grade level specific strategies
  - Help for teaching content to the intent of the standards
  - Grade level specific connections to the Mathematical Habits of Mind

Grade 5 Educators

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning; every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the vertical progression between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' development of conceptual understanding and procedural fluency.

In grade 4, instructional time supports students' development of the following critical skills:	In grade 5, instructional time supports students' development of the following critical skills:
» Developed understanding and fluency with multi-digit multiplication and developed understanding of dividing to find quotients involving multi-digit dividends; » Developed an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; » Developed understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures; and » Developed fluency in addition and subtraction within 1,000,000 using the standard algorithm.	» Developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); » Extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; » Developing an understanding of volume; solving problems using the coordinate plane; and » Working toward fluency with addition, subtraction, and multiplication with multi-digit whole numbers.

Grade 6 Educators

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning; every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the vertical progression between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' development of conceptual understanding and procedural fluency.

In grade 5, instructional time supports students' development of the following critical skills:	In grade 6 instructional time supports students' development of the following critical skills:
» Developed fluency with addition and subtraction of fractions, and developed understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); » Extended division to 2-digit divisors, integrating decimal fractions into the place value system and developed understanding of operations with decimals to hundredths; » Developed fluency with whole number and decimal operations; » Developed an understanding of volume and solving problems using the coordinate plane. » Developed fluency with addition, subtraction, and multiplication with multi-digit whole numbers.	» Connecting ratio, rate, and percentage to whole number multiplication and division and using concepts of ratio and rate to solve problems; » Completing understanding of division of fractions and extending the concept of number to the system of rational numbers, which includes negative numbers; » Writing, interpreting, and using expressions and equations; and » Developing understanding of statistical thinking. » Working toward fluency with multi-digit division and multi-digit decimal operations. Grade six is an especially important year for bridging the concrete concepts of arithmetic and the abstract thinking of algebra.

Grade 7 Educators

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning; every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the vertical progression between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' development of conceptual understanding and procedural fluency.

In grade 6, instructional time supports students' development of the following critical skills:	**In grade 7, instructional time supports students' development of the following critical skills:**
» Connected ratio, rate, and percentage to whole number multiplication and division and using concepts of ratio and rate to solve problems; » Completed understanding of division of fractions and extended the concept of number to the system of rational numbers, which includes negative numbers; » Wrote, interpreted, and used expressions and equations; and » Developed understanding of statistical thinking. » Developed fluency with multi-digit division and multi-digit decimal operations. Grade six is an especially important year for bridging the concrete concepts of arithmetic and the abstract thinking of algebra.	» Developing understanding of and applying proportional relationships, including percentages; » Developing understanding of operations with rational numbers and working with expressions and linear equations; » Solving problems that involve scale drawings and informal geometric constructions and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and » Drawing inferences about populations based on samples. » Working toward fluently solving equations of the form $px + q = r$ and $p(x + q) = r$.

Grade 8 Educators

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning; every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the vertical progression between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' development of conceptual understanding and procedural fluency.

In grade 7, instructional time supports students' development of the following critical skills:	**In grade 8, instructional time supports students' development of the following critical skills:**
» Developed understanding of and applying proportional relationships, including percentages; » Developed understanding of operations with rational numbers and worked with expressions and linear equations; » Solved problems that involve scale drawings and informal geometric constructions and worked with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and » Drew inferences about populations based on samples. » Developed fluently solving equations of the form $px + q = r$ and $p(x + q) = r$	» Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, as well as solving linear equations and systems of linear equations; » Grasping the concept of a function and using functions to describe quantitative relationships; » Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem; and » Working toward fluency in solving linear equations in one variable and in solving sets of two simple equations with two unknowns by inspection.

Mathematics I Educators

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning; every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the vertical progression between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' development of conceptual understanding and procedural fluency.

In grade 8, instructional time supports students' development of the following critical skills:	In Mathematics I, instructional time supports students' development of the following critical skills:
» Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, as well as solving linear equations and systems of linear equations; » Grasping the concept of a function and using functions to describe quantitative relationships; » Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem; and » Working toward fluency in solving linear equations in one variable and in solving sets of two simple equations with two unknowns by inspection.	» Deepening and extending understanding of linear relationships—in part, by contrasting them with exponential phenomena and, in part, by applying linear models to data that exhibit a linear trend; » Continuing work with expressions and modeling and analysis of situations; moving beyond viewing functions as processes that take inputs and yield outputs and beginning to view functions as objects that can be combined with operations (e.g., finding $(f + g)(x) = f(x) + g(x)$); » Interpreting functions that are represented graphically, numerically, symbolically, and verbally, translating between representations, and understanding the limitations of various representations; » Comparing and contrasting linear and exponential functions, distinguishing between additive and multiplicative change; interpreting arithmetic sequences as linear functions and geometric sequences as exponential functions; » Building new functions from existing functions; with a focus on translations of graphs of linear and exponential functions, identify the effect of replacing by $f(x)$ by $f(x) + k$, $k(f(x))$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative). » Solving linear equations and applying related solution techniques and the laws of exponents to the creation and solving of simple exponential equations;

	» Creating and solving systems of equations and inequalities; » Making sense of rational exponents and exploring the algebraic structure of the rational and real number systems; » Developing more formal means of assessing how a model fits data; using regression techniques to describe approximately linear relationships between quantities; using graphical representations and knowledge of the context to make judgments about the appropriateness of linear models; and » Establishing triangle congruence criteria based on analysis of rigid motions and formal constructions; solving problems about triangles, quadrilaterals, and other polygons; building on work with the Pythagorean Theorem to find distances; verifying geometric relationships, including properties of special triangles and quadrilaterals and slopes of parallel and perpendicular lines.

Mathematics II Educators

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning; every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the vertical progression between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' development of conceptual understanding and procedural fluency.

In Mathematics I, instructional time supports students' development of the following critical skills:	In Mathematics II, instructional time supports students' development of the following critical skills:
» Deepening and extending understanding of linear relationships—in part, by contrasting them with exponential phenomena and, in part, by applying linear models to data that exhibit a linear trend; » Continuing work with expressions and modeling and analysis of situations; moving beyond viewing functions as processes that take inputs and yield outputs and beginning to view functions as objects that can be combined with operations (e.g., finding $(f + g)(x) = f(x) + g(x)$); » Interpreting functions that are represented graphically, numerically, symbolically, and verbally, translating between representations, and understanding the limitations of various representations; » Comparing and contrasting linear and exponential functions, distinguishing between additive and multiplicative change; interpreting arithmetic sequences as linear functions and geometric sequences as exponential functions; » Building new functions from existing functions; with a focus on translations of graphs of linear and exponential functions, identify the effect of replacing $f(x)$ by $f(x) + k$, $k(f(x))$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative). » Solving linear equations and applying related solution techniques and the laws of exponents to the creation and solving of simple exponential equations; » Creating and solving systems of equations and inequalities;	» Building new functions from existing functions; with a focus on quadratic functions, identify the effect of replacing $f(x)$ by $f(x) + k$, $k(f(x))$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative). » Comparing the characteristics and behavior of quadratic expressions, equations, and functions to those of linear and exponential relationships from Math I; selecting from these functions to model phenomena. » Creating and solving equations, inequalities, and systems of equations involving exponential and quadratic expressions. » Extending laws of exponents to rational exponents; extending the set of rational numbers to real and complex numbers; » Developing facility with geometric proof; using their understanding of congruence and similarity to prove theorems involving lines, angles, triangles, and other polygons; » Using the concept of similarity to develop an understanding of right-triangle trigonometry; develop a connection between quadratics, Pythagorean relationships, and circles; » Proving basic theorems about circles, chords, secants, tangents, and angle measures; » Writing the equations of circles and parabolas; » Solving quadratic equations to determine intersections between lines and circles, between lines and parabolas, and between two circles; » Developing informal arguments to justify common formulas for circumference, area, and volume of geometric objects, especially those related to circles; and » Expanding their ability to compute and interpret theoretical and experimental probabilities for compound events, attending to mutually exclusive events, independent events, and conditional probability; using probability and data in making and evaluating decisions.

» Making sense of rational exponents and exploring the algebraic structure of the rational and real number systems; » Developing more formal means of assessing how a model fits data; using regression techniques to describe approximately linear relationships between quantities; using graphical representations and knowledge of the context to make judgments about the appropriateness of linear models; and » Establishing triangle congruence criteria based on analysis of rigid motions and formal constructions; solving problems about triangles, quadrilaterals, and other polygons; building on work with the Pythagorean Theorem to find distances; verifying geometric relationships, including properties of special triangles and quadrilaterals and slopes of parallel and perpendicular lines.	

Mathematics III Educators

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning; every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the vertical progression between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' development of conceptual understanding and procedural fluency.

In Mathematics II, instructional time supports students' development of the following critical skills:	In Mathematics III, instructional time supports students' development of the following critical skills:
» Building new functions from existing functions; with a focus on quadratic functions, identify the effect of replacing $f(x)$ by $f(x) + k$, $k(f(x))$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative). » Comparing the characteristics and behavior of quadratic expressions, equations, and functions to those of linear and exponential relationships from Math I; selecting from these functions to model phenomena. » Creating and solving equations, inequalities, and systems of equations involving exponential and quadratic expressions. » Extending laws of exponents to rational exponents; extending the set of rational numbers to real and complex numbers; » Developing facility with geometric proof; using their understanding of congruence and similarity to prove theorems involving lines, angles, triangles, and other polygons; » Using the concept of similarity to develop an understanding of right-triangle trigonometry; develop a connection between quadratics, Pythagorean relationships, and circles; » Proving basic theorems about circles, chords, secants, tangents, and angle measures; » Writing the equations of circles and parabolas; » Solving quadratic equations to determine intersections between lines and circles, between lines and parabolas, and between two circles; » Developing informal arguments to justify common formulas for circumference, area, and volume of geometric objects, especially those related to circles; and » Expanding their ability to compute and interpret theoretical and experimental probabilities for compound events, attending to mutually exclusive events, independent events, and conditional probability; using probability and data in making and evaluating decisions.	» Understanding the structural similarities between the system of polynomials and the system of integers; » Synthesizing and generalizing about a variety of function families; » Extending work with exponential functions to include solving exponential equations with logarithms; » Exploring the effects of transformations on graphs of diverse functions, including functions arising in an application, to abstract the general principle that transformations on a graph always have the same effect, regardless of the type of the underlying functions; » Developing the Laws of Sines and Cosines to find missing measures of general (not necessarily right) triangles; » Developing the concept of radian measure for angles and extending the domain of the trigonometric functions to all real numbers in order to model simple periodic phenomena; » Identifying different ways of collecting data—including sample surveys, experiments, and simulations—and recognize the role that randomness and careful design play in the conclusions that may be drawn; and » Extending their understanding of modeling: identifying appropriate types of functions to model a situation, adjusting parameters to improve the model, and comparing models by analyzing appropriateness of fit and by making judgments about the domain over which a model is a good fit.

Mathematics IV Educators

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning; every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the vertical progression between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' development of conceptual understanding and procedural fluency.

In Mathematics III, instructional time supports students' development of the following critical skills:	In Mathematics IV, instructional time supports students' development of the following critical skills:
» Understanding the structural similarities between the system of polynomials and the system of integers; » Synthesizing and generalizing about a variety of function families; » Extending work with exponential functions to include solving exponential equations with logarithms; » Exploring the effects of transformations on graphs of diverse functions, including functions arising in an application, to abstract the general principle that transformations on a graph always have the same effect, regardless of the type of the underlying functions; » Developing the Laws of Sines and Cosines to find missing measures of general (not necessarily right) triangles; » Developing the concept of radian measure for angles and extending the domain of the trigonometric functions to all real numbers in order to model simple periodic phenomena; » Identifying different ways of collecting data—including sample surveys, experiments, and simulations—and recognize the role that randomness and careful design play in the conclusions that may be drawn; and » Extending their understanding of modeling: identifying appropriate types of functions to model a situation, adjusting parameters to improve the model, and comparing models by analyzing appropriateness of fit and by making judgments about the domain over which a model is a good fit.	» Connecting their understanding of trigonometry and the geometry of the plane to express complex numbers in polar form; » Beginning to work with vectors, representing them geometrically and performing operations with them; » Working with matrices and their operations; » Developing the connection between matrices and transformations of the plane (i.e., a vector in the plane can be multiplied by a matrix to produce another vector); working with matrices from the perspective of transformations; » Finding inverse matrices and using matrices to represent and solve linear systems; » Extending their work with trigonometric functions, investigating the reciprocal functions secant, cosecant, and cotangent and the graphs and properties associated with those functions; » Using trigonometric functions to solve problems that arise in modeling contexts; » Extending work with parabolas and circles to ellipses and hyperbolas; » Working with polar coordinates and curves defined parametrically and connecting these to their other work with trigonometry and complex numbers; and » Work with rational functions that are more complicated, graphing them and determining zeros, -intercepts, symmetry, asymptotes, intervals for which the function is increasing or decreasing, and maximum or minimum points.

Algebra I Educators

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning; every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the vertical progression between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' development of conceptual understanding and procedural fluency.

In grade 8, instructional time supports students' development of the following critical skills:	**In Algebra I, instructional time supports students' development of the following critical skills:**
» Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, as well as solving linear equations and systems of linear equations; » Grasping the concept of a function and using functions to describe quantitative relationships; » Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem; and » Working toward fluency in solving linear equations in one variable and in solving sets of two simple equations with two unknowns by inspection.	» Deepening and extending students' understanding of linear and exponential relationships by comparing and contrasting those relationships and by applying linear models to data that exhibit a linear trend. » Engaging in methods for analyzing, solving, and using exponential and quadratic functions; » Building new functions from existing functions; with a focus on translations of graphs of linear, exponential, and quadratic functions, identify the effect of replacing $f(x)$ by $f(x) + k$, $k(f(x))$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative). » Making sense of rational exponents and explore the algebraic structure of the rational and real number systems; » Extending their understanding of the structure of the number system to explore the structure of algebraic expressions and polynomials; » Working with absolute value equations, linear inequalities, and systems of linear equations; » Building their understanding of functions beyond linear ones by investigating tables, graphs, and equations that build on previous understandings of numbers and expressions; making connections between different representations of the same function; » Building functions in a modeling context and solving problems related to the resulting functions, with a focus on linear, simple exponential, and quadratic equations; » Extending prior experiences with data, using more formal means of assessing how a model fits data; » Using regression techniques to describe approximately linear relationships between quantities; using graphical representations and knowledge of the context to make judgments about the appropriateness of linear models.

Geometry Educators

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning; every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the vertical progression between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' development of conceptual understanding and procedural fluency.

In Algebra I, instructional time supports students' development of the following critical skills:	**In Geometry, instructional time supports students' development of the following critical skills:**
» Deepening and extending students' understanding of linear and exponential relationships by comparing and contrasting those relationships and by applying linear models to data that exhibit a linear trend. » Engaging in methods for analyzing, solving, and using exponential and quadratic functions; » Building new functions from existing functions; with a focus on translations of graphs of linear, exponential, and quadratic functions, identify the effect of replacing $f(x)$ by $f(x) + k$, $k(f(x))$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative). » Making sense of rational exponents and explore the algebraic structure of the rational and real number systems; » Extending their understanding of the structure of the number system to explore the structure of algebraic expressions and polynomials; » Working with absolute value equations, linear inequalities, and systems of linear equations; » Building their understanding of functions beyond linear ones by investigating tables, graphs, and equations that build on previous understandings of numbers and expressions; making connections between different representations of the same function; » Building functions in a modeling context and solving problems related to the resulting functions, with a focus on linear, simple exponential, and quadratic equations; » Extending prior experiences with data, using more formal means of assessing how a model fits data; » Using regression techniques to describe approximately linear relationships between quantities; using graphical representations and knowledge of the context to make judgments about the appropriateness of linear models.	» Developing facility with geometric proof; using their understanding of congruence and similarity to prove theorems involving lines, angles, triangles, and other polygons; » Establishing triangle congruence criteria based on analysis of rigid motions and formal constructions; solving problems about triangles, quadrilaterals, and other polygons; building on work with the Pythagorean Theorem to find distances; verifying geometric relationships, including properties of special triangles and quadrilaterals and slopes of parallel and perpendicular lines. » Proving geometric theorems by using coordinates and describing shapes with equations; » Using the concept of similarity to develop an understanding of right-triangle trigonometry; develop a connection between quadratics, Pythagorean relationships, and circles; » Investigating triangles and determining when they are similar; » Investigate circles and prove theorems about them; » Extending knowledge of area and volume formulas to those for circles, cylinders, and other rounded shapes; » Exploring probability concepts and use probability in real-world situations » Continuing the development of statistics and probability to the investigation of probability concepts in precise terms, including the independence of events and conditional probability.

Algebra II Educators

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning; every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the vertical progression between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' development of conceptual understanding and procedural fluency.

In Geometry, instructional time supports students' development of the following critical skills:	**In Algebra II, instructional time supports students' development of the following critical skills:**
» Developing facility with geometric proof; using their understanding of congruence and similarity to prove theorems involving lines, angles, triangles, and other polygons; » Establishing triangle congruence criteria based on analysis of rigid motions and formal constructions; solving problems about triangles, quadrilaterals, and other polygons; building on work with the Pythagorean Theorem to find distances; verifying geometric relationships, including properties of special triangles and quadrilaterals and slopes of parallel and perpendicular lines. » Proving geometric theorems by using coordinates and describing shapes with equations; » Using the concept of similarity to develop an understanding of right-triangle trigonometry; develop a connection between quadratics, Pythagorean relationships, and circles; » Investigating triangles and determining when they are similar; » Investigate circles and prove theorems about them; » Extending knowledge of area and volume formulas to those for circles, cylinders, and other rounded shapes; » Exploring probability concepts and use probability in real-world situations » Continuing the development of statistics and probability to the investigation of probability concepts in precise terms, including the independence of events and conditional probability.	» Extending the concept of *number* to include complex numbers; understanding that the introduction of this set of numbers yields the solutions of polynomial equations and the Fundamental Theorem of Algebra; » Deepening their understanding of the concept of *function* and apply equation-solving and function concepts to many different types of functions; » Extending the system of polynomial functions, analogous to integers, to the field of rational functions; » Exploring the relationship between exponential functions and their inverses, the logarithmic functions; » Extending trigonometric functions to all real numbers; investigate the graphs and properties of trigonometric functions; » Extending their knowledge of statistics to include understanding *the normal distribution*, and making inferences based on sampling, experiments, and observational studies. » Working with expressions that define, including polynomial, rational, and radical functions, to develop their abilities to model situations and solve equations; » Solving quadratic equations over the set of complex numbers and solving exponential equations using the properties of logarithms; » Using the coordinate plane to extend trigonometry to model periodic phenomena;

	» Exploring the effects of transformations on graphs of diverse functions, including functions arising in applications, to abstract the general principle that transformations on a graph always have the same effect regardless of the type of underlying function; » Identifying appropriate types of functions to model a situation, adjust parameters to improve the model, and compare models by analyzing appropriateness of fit and making judgments about the domain over which a model is a good fit; » Identifying different ways of collecting data—including sample surveys, experiments, and simulations—and the role of randomness and careful design in the conclusions that can be drawn.

Trigonometry/Pre-calculus Educators

The West Virginia College- and Career-Readiness Standards for Mathematics support a vertical progression of learning; every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the vertical progression between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' development of conceptual understanding and procedural fluency.

In Algebra II, instructional time supports students' development of the following critical skills:	**In Trigonometry/Pre-calculus, instructional time supports students' development of the following critical skills:**
» Extending the concept of *number* to include complex numbers; understanding that the introduction of this set of numbers yields the solutions of polynomial equations and the Fundamental Theorem of Algebra; » Deepening their understanding of the concept of *function* and apply equation-solving and function concepts to many different types of functions; » Extending the system of polynomial functions, analogous to integers, to the field of rational functions; » Exploring the relationship between exponential functions and their inverses, the logarithmic functions; » Extending trigonometric functions to all real numbers; investigate the graphs and properties of trigonometric functions; » Extending their knowledge of statistics to include understanding *the normal distribution*, and making inferences based on sampling, experiments, and observational studies. » Working with expressions that define, including polynomial, rational, and radical functions, to develop their abilities to model situations and solve equations; » Solving quadratic equations over the set of complex numbers and solving exponential equations using the properties of logarithms; » Using the coordinate plane to extend trigonometry to model periodic phenomena;	» Connecting their understanding of trigonometry and the geometry of the plane to express complex numbers in polar form; » Beginning to work with vectors, representing them geometrically and performing operations with them; » Working with matrices and their operations; » Developing the connection between matrices and transformations of the plane (i.e., a vector in the plane can be multiplied by a matrix to produce another vector); working with matrices from the perspective of transformations; » Finding inverse matrices and using matrices to represent and solve linear systems; » Extending their work with trigonometric functions, investigating the reciprocal functions secant, cosecant, and cotangent and the graphs and properties associated with those functions; » Using trigonometric functions to solve problems that arise in modeling contexts; » Extending work with parabolas and circles to ellipses and hyperbolas; » Working with polar coordinates and curves defined parametrically and connecting these to their other work with trigonometry and complex numbers; and » Work with rational functions that are more complicated, graphing them and determining zeros, -intercepts, symmetry, asymptotes, intervals for which the function is increasing or decreasing, and maximum or minimum points.

» Exploring the effects of transformations on graphs of diverse functions, including functions arising in applications, to abstract the general principle that transformations on a graph always have the same effect regardless of the type of underlying function; » Identifying appropriate types of functions to model a situation, adjust parameters to improve the model, and compare models by analyzing appropriateness of fit and making judgments about the domain over which a model is a good fit; » Identifying different ways of collecting data—including sample surveys, experiments, and simulations—and the role of randomness and careful design in the conclusions that can be drawn.	

Appendix D – Science Critical Prerequisite Skills

Introduction

The Next Generation of Content Standards and Objectives for Science in West Virginia Schools support a vertical progression of learning that is comprehensive and rigorous. The content knowledge and skills targeted in each standard are developed over the course of a students' K-12 education with each year's skill development building upon prior years. This vertical progression means that every standard plays a role in the development of critical prerequisite skills for understanding content for the following year.

The science content of the Next Generation of Content Standards and Objectives for Science in West Virginia Schools are end-of-grade-level expectations for what students should know, understand and be able to do. The science and engineering practices are on programmatic levels by design and are the skills of the science courses. Science knowledge is acquired concurrently as science skills are used and developed, each supporting the progression of the other.

Science skills are the practices employed by scientists and engineers to make sense of and solve problems in the world around us. As students engage in the science and engineering practices, they do the things that scientists and engineers do.

As students engage in engineering practices, they are better able understand the work of engineers, as well as the connections between engineering and science. They learn to identify problems, and propose and test possible solutions, in essence, they become problem solvers.

As students engage in science practices, they are better able to understand how scientific knowledge develops. Such direct involvement gives them an appreciation of the wide range of approaches that are used to investigate, model, and explain the world. These experiences build foundational knowledge which prepares students for more rigorous studies not only in the sciences but other areas of study, as well.

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Next Generation Content Standards and Objectives for Science

Next Generation of Content Standards and Objectives for Science in West Virginia Schools are blend of three dimensions of learning:

- science content knowledge, also known as science facts
- science and engineering practices or the behaviors that scientists use to answer questions and engineers use to solve problems in the real world, and
- cross-cutting concepts or big ideas that connect ideas from different scientific disciplines.

Science and Engineering Practices

The Science and Engineering Practices are key components of the Next Generation Science Standards and provide commonality of practice among content areas throughout K-12 science standards.

Grade 6 – Grade 8
The Science and Engineering Practices are listed below with the progression of each practice specific for grades 6-8. For more details, see *Science and Engineering Practices in the NGSS.*

Practice 1 - Asking questions and defining problems in grades 6–8 builds on the K–5 experiences and progresses to specifying relationships between variables and clarifying arguments and models.

- Ask questions
  - that arise from careful observation of phenomena, models, or unexpected results, to clarify and/or seek additional information.
  - to identify and/or clarify evidence and/or the premise(s) of an argument.
  - to determine relationships between independent and dependent variables and relationships in models.
  - to clarify and/or refine a model, an explanation, or an engineering problem.
  - that require sufficient and appropriate empirical evidence to answer.
  - that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles.
  - that challenge the premise(s) of an argument or the interpretation of a data set.
- Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions.

Practice 2 - Modeling in grades 6–8 builds on the K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.

- Evaluate limitations of a model for a proposed object or tool.
- Develop or modify a model—based on evidence – to match what happens if a variable or component of a system is changed.
- Use and/or develop a model of simple systems with uncertain and less predictable factors.
- Develop and/or revise a model to show the relationships among variables, including those that are not observable but predict observable phenomena.
- Develop and/or use a model to predict and/or describe phenomena.
- Develop a model to describe unobservable mechanisms.

- Develop and/or use a model to generate data to test ideas about phenomena in natural or designed systems, including those representing inputs and outputs, and those at unobservable scales.

Practice 3 - Planning and carrying out investigations in grades 6-8 builds on the K-5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions.

- Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim.
- Conduct an investigation and/or evaluate and/or revise the experimental design to produce data to serve as the basis for evidence that meet the goals of the investigation.
- Evaluate the accuracy of various methods for collecting data.
- Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions.
- Collect data about the performance of a proposed object, tool, process or system under a range of conditions.

Practice 4 - Analyzing data in grades 6–8 builds on the K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.

- Construct, analyze, and/or interpret graphical displays of data and/or large data sets to identify linear and nonlinear relationships.
- Use graphical displays (e.g., maps, charts, graphs, and/or tables) of large data sets to identify temporal and spatial relationships.
- Distinguish between causal and correlational relationships in data.
- Analyze and interpret data to provide evidence for phenomena.
- Apply concepts of statistics and probability (including mean, median, mode, and variability) to analyze and characterize data, using digital tools when feasible.
- Consider limitations of data analysis (e.g., measurement error), and/or seek to improve precision and accuracy of data with better technological tools and methods (e.g., multiple trials).
- Analyze and interpret data to determine similarities and differences in findings.
- Analyze data to define an optimal operational range for a proposed object, tool, process or system that best meets criteria for success.

Practice 5 - Mathematical and computational thinking in grades 6–8 builds on the K–5 experiences and progresses to identifying patterns in large data sets and using mathematical concepts to support explanations and arguments.

- Use digital tools (e.g., computers) to analyze very large data sets for patterns and trends.
- Use mathematical representations to describe and/or support scientific conclusions and design solutions.
- Create algorithms (a series of ordered steps) to solve a problem.
- Apply mathematical concepts and/or processes (e.g., ratio, rate, percent, basic operations, simple algebra) to scientific and engineering questions and problems.
- Use digital tools and/or mathematical concepts and arguments to test and compare proposed solutions to an engineering design problem.

Practice 6 - Constructing explanations and designing solutions in grades 6–8 builds on the K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

- Construct an explanation that includes qualitative or quantitative relationships between variables that predict(s) and/or describe(s) phenomena.
- Construct an explanation using models or representations.
- Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
- Apply scientific ideas, principles, and/or evidence to construct, revise and/or use an explanation for real-world phenomena, examples, or events.
- Apply scientific reasoning to show why the data or evidence is adequate for the explanation or conclusion.
- Apply scientific ideas or principles to design, construct, and/or test a design of an object, tool, process or system.
- Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints.
- Optimize performance of a design by prioritizing criteria, making tradeoffs, testing, revising, and re-testing.

Practice 7 - Engaging in argument from evidence in grades 6–8 builds on the K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).

- Compare and critique two arguments on the same topic and analyze whether they emphasize similar or different evidence and/or interpretations of facts.
- Respectfully provide and receive critiques about one's explanations, procedures, models, and questions by citing relevant evidence and posing and responding to questions that elicit pertinent elaboration and detail.
- Construct, use, and/or present an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.
- Make an oral or written argument that supports or refutes the advertised performance of a device, process, or system based on empirical evidence concerning whether or not the technology meets relevant criteria and constraints.
- Evaluate competing design solutions based on jointly developed and agreed-upon design criteria.

Practice 8 - Obtaining, evaluating, and communicating information in grades 6–8 builds on the K–5 experiences and progresses to evaluating the merit and validity of ideas and methods.

- Critically read scientific texts adapted for classroom use to determine the central ideas and/or obtain scientific and/or technical information to describe patterns in and/or evidence about the natural and designed world(s).
- Integrate qualitative and/or quantitative scientific and/or technical information in written text with that contained in media and visual displays to clarify claims and findings.
- Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence.
- Evaluate data, hypotheses, and/or conclusions in scientific and technical texts in light of competing information or accounts.
- Communicate scientific and/or technical information (e.g. about a proposed object, tool, process, system) in writing and/or through oral presentations.

Grade 9 – Grade 12

The Science and Engineering Practices are listed below with the progression of each practice specific for grades 9-12. For more details, see *Science and Engineering Practices in the NGSS.*

Practice 1 - Asking questions and defining problems in grades 9-12 builds on K–8 experiences and progresses to formulating, refining, and evaluating empirically testable questions and design problems using models and simulations.

- Ask questions
  - that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.
  - that arise from examining models or a theory, to clarify and/or seek additional information and relationships.
  - to determine relationships, including quantitative relationships, between independent and dependent variables.
  - to clarify and refine a model, an explanation, or an engineering problem.
- Evaluate a question to determine if it is testable and relevant.
- Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.
- Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.
- Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.

Practice 2 - Modeling in grades 9-12 builds on K–8 experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.

- Evaluate merits and limitations of two different models of the same proposed tool, process, mechanism or system in order to select or revise a model that best fits the evidence or design criteria.
- Design a test of a model to ascertain its reliability.

- Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.
- Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena and move flexibly between model types based on merits and limitations.
- Develop a complex model that allows for manipulation and testing of a proposed process or system.
- Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Practice 3 - Planning and carrying out investigations in grades 9-12 builds on K-8 experiences and progresses to include investigations that provide evidence for and test conceptual, mathematical, physical, and empirical models.

- Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.
- Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.
- Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.
- Select appropriate tools to collect, record, analyze, and evaluate data.
- Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.
- Manipulate variables and collect data about a complex model of a proposed process or system to identify failure points or improve performance relative to criteria for success or other variables.

Practice 4 - Analyzing data in grades 9-12 on K–8 experiences and progresses to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data.

- Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.
- Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.
- Consider limitations of data analysis (e.g., measurement error, sample selection) when analyzing and interpreting data.
- Compare and contrast various types of data sets (e.g., self-generated, archival) to examine consistency of measurements and observations.
- Evaluate the impact of new data on a working explanation and/or model of a proposed process or system.
- Analyze data to identify design features or characteristics of the components of a proposed process or system to optimize it relative to criteria for success.

Practice 5 - Mathematical and computational thinking in grades 9-12 builds on K-8 experiences and progresses to using algebraic thinking and analysis, a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions.

- Create and/or revise a computational model or simulation of a phenomenon, designed device, process, or system.
- Use mathematical, computational, and/or algorithmic representations of phenomena or design solutions to describe and/or support claims and/or explanations.
- Apply techniques of algebra and functions to represent and solve scientific and engineering problems.
- Use simple limit cases to test mathematical expressions, computer programs, algorithms, or simulations of a process or system to see if a model "makes sense" by comparing the outcomes with what is known about the real world.
- Apply ratios, rates, percentages, and unit conversions in the context of complicated measurement problems involving quantities with derived or compound units (such as mg/mL, kg/m3, acre-feet, etc.).

Practice 6 - Constructing explanations and designing solutions in grades 6–8 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles, and theories.

- Make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables.
- Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
- Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.
- Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.
- Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Practice 7 - Engaging in argument from evidence in grades 9-12 builds on K–8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed world(s). Arguments may also come from current scientific or historical episodes in science.

- Compare and evaluate competing arguments or design solutions in light of currently accepted explanations, new evidence, limitations (e.g., trade-offs), constraints, and ethical issues.
- Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.
- Respectfully provide and/or receive critiques on scientific arguments by probing reasoning and evidence, challenging ideas and conclusions, responding thoughtfully to diverse perspectives, and determining additional information required to resolve contradictions.

- Construct, use, and/or present an oral and written argument or counter-arguments based on data and evidence.
- Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.
- Evaluate competing design solutions to a real-world problem based on scientific ideas and principles, empirical evidence, and/or logical arguments regarding relevant factors (e.g. economic, societal, environmental, ethical considerations).

Practice 8 - Obtaining, evaluating, and communicating information in grades 9-12 builds on K–8 experiences and progresses to evaluating the validity and reliability of the claims, methods, and designs.

- Critically read scientific texts adapted for classroom use to determine the central ideas and/or obtain scientific and/or technical information to describe patterns in and/or evidence about the natural and designed world(s).
- Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.
- Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.
- Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible.
- Communicate scientific and/or technical information or ideas (e.g. about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Cross-Cutting Concepts

The Crosscutting Concepts are key components of the Next Generation Science Standards and provide commonality and connections between content areas throughout K-12 standards.

Grade 6 – Grade 8

Crosscutting Concepts are listed below with the progression of each concept specific for grades 6-8. For more details, see *Crosscutting Concepts*

1. ***Patterns -*** Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.
   In grades 6-8, students recognize that macroscopic patterns are related to the nature of microscopic and atomic-level structure. They identify patterns in rates of change and other numerical relationships that provide information about natural and human designed systems. They use patterns to identify cause and effect relationships and use graphs and charts to identify patterns in data.
2. ***Cause and Effect -*** Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.
   In grades 6-8, students classify relationships as causal or correlational, and recognize that correlation does not necessarily imply causation. They use cause and effect relationships to predict phenomena in natural or designed systems. They also understand that phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.
3. ***Scale, proportion, and quantity -*** In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.
   In grades 6-8, students observe time, space, and energy phenomena at various scales using models to study systems that are too large or too small. They understand phenomena observed at one scale may not be observable at another scale, and the function of natural and designed systems may change with scale. They use proportional relationships (e.g., speed as the ratio of distance traveled to time taken) to gather information about the magnitude of properties and processes. They represent scientific relationships through the use of algebraic expressions and equations.
4. ***Systems and system models -*** Defining the system under study—specifying its boundaries and making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering.
   In grades 6-8, students can understand that systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. They can use models to represent systems and their interactions—such as inputs, processes and outputs—and energy, matter, and information flows within systems. They can also learn that models are limited in that they only represent certain aspects of the system under study.

5. ***Energy and matter -*** Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems' possibilities and limitations.
   In grades 6-8, students learn matter is conserved because atoms are conserved in physical and chemical processes. They also learn within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter. Energy may take different forms (e.g. energy in fields, thermal energy, energy of motion). The transfer of energy can be tracked as energy flows through a designed or natural system.
6. ***Structure and function -*** The way in which an object or living thing is shaped and its substructure determine many of its properties and functions.
   In grades 6-8, students model complex and microscopic structures and systems and visualize how their function depends on the shapes, composition, and relationships among its parts. They analyze many complex natural and designed structures and systems to determine how they function. They design structures to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.
7. ***Stability and change -*** For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study.
   In grades 6-8, students explain stability and change in natural or designed systems by examining changes over time, and considering forces at different scales, including the atomic scale. Students learn changes in one part of a system might cause large changes in another part, systems in dynamic equilibrium are stable due to a balance of feedback mechanisms, and stability might be disturbed by either sudden events or gradual changes that accumulate over time.

Grade 9 – Grade 12

Crosscutting Concepts are listed below with the progression of each concept specific for grades 9-12. For more details, see *Crosscutting Concepts*

1. ***Patterns-*** Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.
   In grades 9-12, students observe patterns in systems at different scales and cite patterns as empirical evidence for causality in supporting their explanations of phenomena. They recognize classifications or explanations used at one scale may not be useful or need revision using a different scale; thus requiring improved investigations and experiments. They use mathematical representations to identify certain patterns and analyze patterns of performance in order to reengineer and improve a designed system.
2. ***Cause and Effect -*** Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.
   In grades 9-12, students understand that empirical evidence is required to differentiate between cause and correlation and to make claims about specific causes and effects. They suggest cause and effect relationships to explain and predict behaviors in complex natural and designed systems. They also propose causal relationships by examining what is known about smaller scale mechanisms within the system. They recognize changes in systems may have various causes that may not have equal effects.

3. ***Scale, proportion, and quantity -*** In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.
   In grades 9-12, students understand the significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs. They recognize patterns observable at one scale may not be observable or exist at other scales, and some systems can only be studied indirectly as they are too small, too large, too fast, or too slow to observe directly. Students use orders of magnitude to understand how a model at one scale relates to a model at another scale. They use algebraic thinking to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).
4. ***Systems and system models -*** Defining the system under study—specifying its boundaries and making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering.
   In grades 9-12, students can investigate or analyze a system by defining its boundaries and initial conditions, as well as its inputs and outputs. They can use models (e.g., physical, mathematical, computer models) to simulate the flow of energy, matter, and interactions within and between systems at different scales. They can also use models and simulations to predict the behavior of a system, and recognize that these predictions have limited precision and reliability due to the assumptions and approximations inherent in the models. They can also design systems to do specific tasks.
5. ***Energy and matter -*** Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems' possibilities and limitations.
   In grades 9-12, students learn that the total amount of energy and matter in closed systems is conserved. They can describe changes of energy and matter in a system in terms of energy and matter flows into, out of, and within that system. They also learn that energy cannot be created or destroyed. It only moves between one place and another place, between objects and/or fields, or between systems. Energy drives the cycling of matter within and between systems. In nuclear processes, atoms are not conserved, but the total number of protons plus neutrons is conserved.
6. ***Structure and function -*** The way in which an object or living thing is shaped and its substructure determine many of its properties and functions.
   In grades 9-12, students investigate systems by examining the properties of different materials, the structures of different components, and their interconnections to reveal the system's function and/or solve a problem. They infer the functions and properties of natural and designed objects and systems from their overall structure, the way their components are shaped and used, and the molecular substructures of their various materials.
7. ***Stability and change -*** For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study.
   In grades 9-12, students understand much of science deals with constructing explanations of how things change and how they remain stable. They quantify and model changes in systems over very short or very long periods of time. They see some changes are irreversible, and negative feedback can stabilize a system, while positive feedback can destabilize it. They recognize systems can be designed for greater or lesser stability.

How to Use this Resource

This guide can be used to support individual reflection and to enhance collaborative conversations among educators regarding students' progression through the grade-level standards and the gaps in content and skills that may be present during the next academic year.

Examples of Use

- Support students progressing to the next grade level and their new teacher by:
  - examining the questions which address science topics in the grade level you teach compared to those in the next grade level
  - reflecting on how science and engineering practices were incorporated to address the topics during the year and how students were progressing with those skills and each topic
  - answering the reflection questions and sharing data and insights with students' teacher(s) in the next grade level
  - engaging in collaborative conversations with your students' teacher(s) in the next grade level regarding students' progress with critical skills, science topics, and specific standards and sharing strategies and techniques for accelerating students' science achievement

- Support your new students by:
  - examining the questions which address science topics in the grade level you teach compared to those in the previous grade
  - reflecting on the relationship of topics you see between the two grade levels and the strategies and techniques you use to support students' progression with skills and topics each year
  - answering the reflection questions and gathering data about incoming students' skill progression, engagement levels, and interests from their previous teacher(s) as well as from students, families, and other sources of student data
  - engaging in collaborative conversations with students' teacher(s) in the previous grade level regarding students' progress with critical skills and specific standards and sharing strategies and techniques for accelerating students' science achievement

Additional Supports for Reflection and Collaborative Conversations

- *Policy 2520.3C The Next Generation of Content Standards and Objectives for Science in West Virginia Schools*
- *Progressions within the Next Generation of Science Standards*
- *Science and Engineering Practices in the NGSS*

For grade 6 collaborative conversations with grade 5

In grade 5, instructional time supports students using science and engineering practices to formulate answers to questions such as	In grade 6, instructional time supports students using science and engineering practices to formulate answers to questions such as
» When matter changes, does its weight change? » How much water can be found in different places on Earth? » Can new substances be created by combining other substances? » How does matter cycle through ecosystems? Where does the energy in food come from and what is it used for? » How do lengths and directions of shadows or relative lengths of day and night change from day to day? » How does the appearance of some stars change in different seasons? » How can they define problems, generate and compare possible solutions, carry out fair tests?	» What are the characteristic properties of waves and how can they be used? » How does a system of living and non-living things operate to meet the needs of the organisms in an ecosystem? » What is Earth's place in the Universe? » What makes up our solar system and how can the motion of Earth explain seasons and eclipses? » What factors interact and influence weather and climate? » How can natural hazards be predicted? » How can they define problems more precisely, to conduct a more thorough process of choosing the best solution, and to optimize the final design?

Beginning of the Year Self-Reflection Questions:

6th Grade Teacher:

» How do I normally tier instruction to bridge the increased rigor and complexity between the 5th grade standards and the 6th grade standards?
» What strategies and scaffolds do I already know that I can draw on to support students who may have fallen behind?
» What additional information/data do I need about students' strengths and weaknesses?

Notes:

Beginning of the Year Collaborative Conversation Starters	Notes
» What science objectives were addressed really well during the past school year? » What science objectives were not addressed during the past school year? » What Science and Engineering Practices were not addressed during the past school year? » What Crosscutting Concepts might be used to bridge connections between 5th and the 6th grade science objectives? » What strategies did the 5th grade teacher use that were successful? » Might these strategies be incorporated into 6th grade instruction?	

Cross Cutting Concepts Checklist

1. Patterns
2. Cause and Effect
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter
6. Structure and function
7. Stability and change

Practices Checklist

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

On-Going Self-Reflection Questions	Notes
» How am I monitoring students' progress throughout the year? » What strategies and scaffolds am I using to support students who may need additional assistance?	

For grade 6 collaborative conversations with grade 7

In grade 6, instructional time supports students using science and engineering practices to formulate answers to questions such as	In grade 7, instructional time supports students using science and engineering practices to formulate answers to questions such as
» What are the characteristic properties of waves and how can they be used? » How does a system of living and non-living things operate to meet the needs of the organisms in an ecosystem? » What is Earth's place in the Universe? » What makes up our solar system and how can the motion of Earth explain seasons and eclipses? » What factors interact and influence weather and climate? » How can natural hazards be predicted? » How can they define problems more precisely, to conduct a more thorough process of choosing the best solution, and to optimize the final design?	» How can one describe physical interactions between objects and within systems of objects? » How can energy be transferred from one object or system to another? » How can one explain the ways cells contribute to the function of living organisms? » How do people figure out that the Earth and life on Earth have changed over time? » How does the movement of tectonic plates impact the surface of Earth? » How do the materials in and on Earth's crust change over time? » How does water influence weather, circulate in the oceans, and shape Earth's surface? » How do human activities affect Earth systems? » How can they define problems more precisely, to conduct a more thorough process of choosing the best solution, and to optimize the final design?

Self-Reflection Questions:

6th Grade Teacher:

» Which of these topics had I hit really hard already?
» How were my students doing these topics when we transitioned to remote learning? How do I know?
» How engaged were my students with these topics during remote learning?
» How well did the remote learning resources provide opportunities for students to engage in science and engineering practices?
» How well did the remote learning resources provide opportunities for students to make connections through Crosscutting Concepts?
» Which topics/practices/crosscutting concepts did I plan to re-emphasize if I'd had time?
» Do any students stand out to me as needing more support in these areas? How do I know?

Notes:

Collaborative Conversation Starters	Notes
» What science objectives were addressed really well during the past school year? » What science objectives were not addressed during the past school year? » What Science and Engineering Practices were not addressed during the past school year? » What Crosscutting Concepts might be used to bridge connections between 6th and the 7th grade science objectives? » What strategies did the 6th grade teacher use that were successful? » Might these strategies be incorporated into 7th grade instruction?	

For grade 7 collaborative conversations with grade 6

In grade 6, instructional time supports students using science and engineering practices to formulate answers to questions such as	In grade 7, instructional time supports students using science and engineering practices to formulate answers to questions such as
» What are the characteristic properties of waves and how can they be used? » How does a system of living and non-living things operate to meet the needs of the organisms in an ecosystem? » What is Earth's place in the Universe? » What makes up our solar system and how can the motion of Earth explain seasons and eclipses? » What factors interact and influence weather and climate? » How can natural hazards be predicted? » How can they define problems more precisely, to conduct a more thorough process of choosing the best solution, and to optimize the final design?	» How can one describe physical interactions between objects and within systems of objects? » How can energy be transferred from one object or system to another? » How can one explain the ways cells contribute to the function of living organisms? » How do people figure out that the Earth and life on Earth have changed over time? » How does the movement of tectonic plates impact the surface of Earth? » How do the materials in and on Earth's crust change over time? » How does water influence weather, circulate in the oceans, and shape Earth's surface? » How do human activities affect Earth systems? » How can they define problems more precisely, to conduct a more thorough process of choosing the best solution, and to optimize the final design?

Beginning of the Year Self-Reflection Questions:

7th Grade Teacher:

» How do I normally tier instruction to bridge the increased rigor and complexity between the 6th grade standards and the 7th grade standards?
» What strategies and scaffolds do I already know that I can draw on to support students who may have fallen behind?
» What additional information/data do I need about students' strengths and weaknesses?

Beginning of the Year Collaborative Conversation Starters	Notes
» What objectives were not addressed during the past school year? » What Science and Engineering Practices were not addressed during the past school year? » What Crosscutting Concepts might be used to bridge connections between 6th and the 7th grade science objectives? » What strategies did the 6th grade teacher use that were successful? » Might these strategies be incorporated into 7th grade instruction?	

Cross Cutting Concepts Checklist

1. Patterns
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4. Systems and system models
5. Energy and matter
6. Structure and function
7. Stability and change

Practices Checklist

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

On-Going Self-Reflection Questions	Notes
» How am I monitoring students' progress throughout the year? » What strategies and scaffolds am I using to support students who may need additional assistance?	

For grade 7 collaborative conversations with grade 8

In grade 7, instructional time supports students using science and engineering practices to formulate answers to questions such as	In grade 8, instructional time supports students using science and engineering practices to formulate answers to questions such as
» How can one describe physical interactions between objects and within systems of objects? » How can energy be transferred from one object or system to another? » How can one explain the ways cells contribute to the function of living organisms? » How do people figure out that the Earth and life on Earth have changed over time? » How does the movement of tectonic plates impact the surface of Earth? » How do the materials in and on Earth's crust change over time? » How does water influence weather, circulate in the oceans, and shape Earth's surface? » How do human activities affect Earth systems? » How can they define problems more precisely, to conduct a more thorough process of choosing the best solution, and to optimize the final design?	» How can particles combine to produce a substance with different properties? » How does thermal energy affect particles? » What happens when new materials are formed? » What stays the same and what changes? » How do living organisms pass traits from one generation to the next? » How do organisms change over time in response to changes in the environment? » How do human populations and consumption of natural resources affect Earth systems? » How can they define problems more precisely, to conduct a more thorough process of choosing the best solution, and to optimize the final design?

Self-Reflection Questions:

7th Grade Teacher:

» Which of these topics had I hit really hard already?
» How were my students doing these topics when we transitioned to remote learning? How do I know?
» How engaged were my students with these topics during remote learning?
» How well did the remote learning resources provide opportunities for students to engage in science and engineering practices?
» How well did the remote learning resources provide opportunities for students to make connections through Crosscutting Concepts?
» Which topics/practices/crosscutting concepts did I plan to re-emphasize if I'd had time?
» Do any students stand out to me as needing more support in these areas? How do I know?

Notes:

Collaborative Conversation Starters	Notes
» What science objectives were addressed really well during the past school year? » What science objectives were not addressed during the past school year? » What Science and Engineering Practices were not addressed during the past school year? » What Crosscutting Concepts might be used to bridge connections between 7th and the 8th grade science objectives? » What strategies did the 7th grade teacher use that were successful? » Might these strategies be incorporated into 8th grade instruction?	

For grade 8 collaborative conversations with grade 7

In grade 7, instructional time supports students using science and engineering practices to formulate answers to questions such as	In grade 8, instructional time supports students using science and engineering practices to formulate answers to questions such as
» How can one describe physical interactions between objects and within systems of objects? » How can energy be transferred from one object or system to another? » How can one explain the ways cells contribute to the function of living organisms? » How do people figure out that the Earth and life on Earth have changed over time? » How does the movement of tectonic plates impact the surface of Earth? » How do the materials in and on Earth's crust change over time? » How does water influence weather, circulate in the oceans, and shape Earth's surface? » How do human activities affect Earth systems? » How can they define problems more precisely, to conduct a more thorough process of choosing the best solution, and to optimize the final design?	» How can particles combine to produce a substance with different properties? » How does thermal energy affect particles? » What happens when new materials are formed? » What stays the same and what changes? » How do living organisms pass traits from one generation to the next? » How do organisms change over time in response to changes in the environment? » How do human populations and consumption of natural resources affect Earth systems? » How can they define problems more precisely, to conduct a more thorough process of choosing the best solution, and to optimize the final design?

Beginning of the Year Self-Reflection Questions:

8th Grade Teacher:

» How do I normally tier instruction to bridge the increased rigor and complexity between the 7th grade standards and the 8th grade standards?
» What strategies and scaffolds do I already know that I can draw on to support students who may have fallen behind?
» What additional information/data do I need about students' strengths and weaknesses?

Notes:

Beginning of the Year Collaborative Conversation Starters	Notes
» What science objectives were addressed really well during the past school year? » What science objectives were not addressed during the past school year? » What Science and Engineering Practices were not addressed during the past school year? » What Crosscutting Concepts might be used to bridge connections between 7th and the 8th grade science objectives? » What strategies did the 7th grade teacher use that were successful? » Might these strategies be incorporated into 8th grade instruction?	

Cross Cutting Concepts Checklist

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4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

On-Going Self-Reflection Questions	Notes
» How am I monitoring students' progress throughout the year? » What strategies and scaffolds am I using to support students who may need additional assistance?	

For grade 8 collaborative conversations with grade 9

In grade 8, instructional time supports students using science and engineering practices to formulate answers to questions such as	In grade 9, instructional time supports students using science and engineering practices to formulate answers to questions such as
» How can particles combine to produce a substance with different properties? » How does thermal energy affect particles? » What happens when new materials are formed? » What stays the same and what changes? » How do living organisms pass traits from one generation to the next? » How do organisms change over time in response to changes in the environment? » How do human populations and consumption of natural resources affect Earth systems? » How can they define problems more precisely, to conduct a more thorough process of choosing the best solution, and to optimize the final design?	» How do the major Earth systems interact? » How do the properties and movements of water shape Earth's surface and affect its systems? » What regulates weather and climate? » How do humans depend on Earth's resources? » How do people model and predict the effects of human activities on Earth's climate? » How can they engage with major global issues at the interface of science, technology, society and the environment? » How can they bring to bear the kinds of analytical and strategic thinking that prior training and increased maturity make possible to › define problems, › develop possible solutions, › and improve designs?

Self-Reflection Questions:

8th Grade Teacher:

» Which of these topics had I hit really hard already?
» How were my students doing these topics when we transitioned to remote learning? How do I know?
» How engaged were my students with these topics during remote learning?
» How well did the remote learning resources provide opportunities for students to engage in science and engineering practices?
» How well did the remote learning resources provide opportunities for students to make connections through Crosscutting Concepts?
» Which topics/practices/crosscutting concepts did I plan to re-emphasize if I'd had time?
» Do any students stand out to me as needing more support in these areas? How do I know?

Notes:

Collaborative Conversation Starters	Notes
» What science objectives were addressed really well during the past school year? » What science objectives were not addressed during the past school year? » What Science and Engineering Practices were not addressed during the past school year? » What Crosscutting Concepts might be used to bridge connections between 8th and the 9th grade science objectives? » What strategies did the 8th grade teacher use that were successful? » Might these strategies be incorporated into 9th grade instruction?	

For grade 9 collaborative conversations with grade 8

In grade 8, instructional time supports students using science and engineering practices to formulate answers to questions such as	In grade 9, instructional time supports students using science and engineering practices to formulate answers to questions such as
» How can particles combine to produce a substance with different properties? » How does thermal energy affect particles? » What happens when new materials are formed? » What stays the same and what changes? » How do living organisms pass traits from one generation to the next? » How do organisms change over time in response to changes in the environment? » How do human populations and consumption of natural resources affect Earth systems? » How can they define problems more precisely, to conduct a more thorough process of choosing the best solution, and to optimize the final design?	» How do the major Earth systems interact? » How do the properties and movements of water shape Earth's surface and affect its systems? » What regulates weather and climate? » How do humans depend on Earth's resources? » How do people model and predict the effects of human activities on Earth's climate? » How can they engage with major global issues at the interface of science, technology, society and the environment? » How can they bring to bear the kinds of analytical and strategic thinking that prior training and increased maturity make possible to › define problems, › develop possible solutions, › and improve designs?

Beginning of the Year Self-Reflection Questions:

9th Grade Teacher:

» How do I normally tier instruction to bridge the increased rigor and complexity between the 8th grade standards and the 9th grade standards?
» What strategies and scaffolds do I already know that I can draw on to support students who may have fallen behind?
» What additional information/data do I need about students' strengths and weaknesses?

Notes:

Beginning of the Year Collaborative Conversation Starters	Notes
» What science objectives were addressed really well during the past school year? » What science objectives were not addressed during the past school year? » What Science and Engineering Practices were not addressed during the past school year? » What Crosscutting Concepts might be used to bridge connections between 8th and the 9th grade science objectives? » What strategies did the 8th grade teacher use that were successful? » Might these strategies be incorporated into 9th grade instruction?	

Cross Cutting Concepts Checklist

1. Patterns
2. Cause and Effect
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter
6. Structure and function
7. Stability and change

Practices Checklist

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

On-Going Self-Reflection Questions	Notes
» How am I monitoring students' progress throughout the year? » What strategies and scaffolds am I using to support students who may need additional assistance?	

For grade 9 collaborative conversations with grade 10

In grade 9, instructional time supports students using science and engineering practices to formulate answers to questions such as	In grade 10, instructional time supports students using science and engineering practices to formulate answers to questions such as
» How do the major Earth systems interact? » How do the properties and movements of water shape Earth's surface and affect its systems? » What regulates weather and climate? » How do humans depend on Earth's resources? » How do people model and predict the effects of human activities on Earth's climate? » How can they engage with major global issues at the interface of science, technology, society and the environment? » How can they bring to bear the kinds of analytical and strategic thinking that prior training and increased maturity make possible to » define problems, » develop possible solutions, » and improve designs?	» How do the structures of organisms enable life's functions?" » How are the characteristics from one generation related to the previous generation? » How do organisms obtain and use the energy they need to live and grow? » How do matter and energy move through ecosystems?" » How do organisms interact with the living and non-living environment to obtain matter and energy?" » How can there be so many similarities among organisms yet so many different plants, animals, and microorganisms? » How does biodiversity affect humans?" » How can they bring to bear the kinds of analytical and strategic thinking that prior training and increased maturity make possible to › define problems, › develop possible solutions, › and improve designs?

Self-Reflection Questions:

9th Grade Teacher:

» Which of these topics had I hit really hard already?
» How were my students doing these topics when we transitioned to remote learning? How do I know?
» How engaged were my students with these topics during remote learning?
» How well did the remote learning resources provide opportunities for students to engage in science and engineering practices?
» How well did the remote learning resources provide opportunities for students to make connections through Crosscutting Concepts?
» Which topics/practices/crosscutting concepts did I plan to re-emphasize if I'd had time?
» Do any students stand out to me as needing more support in these areas? How do I know?

Notes:

Collaborative Conversation Starters	Notes
» What science objectives were addressed really well during the past school year? » What science objectives were not addressed during the past school year? » What Science and Engineering Practices were not addressed during the past school year? » What Crosscutting Concepts might be used to bridge connections between 9th and the 10th grade science objectives? » What strategies did the 9th grade teacher use that were successful? » Might these strategies be incorporated into 10th grade instruction?	

For grade 10 collaborative conversations with grade 9

In grade 9, instructional time supports students using science and engineering practices to formulate answers to questions such as	In grade 10, instructional time supports students using science and engineering practices to formulate answers to questions such as
» How do the major Earth systems interact? » How do the properties and movements of water shape Earth's surface and affect its systems? » What regulates weather and climate? » How do humans depend on Earth's resources? » How do people model and predict the effects of human activities on Earth's climate? » How can they engage with major global issues at the interface of science, technology, society and the environment? » How can they bring to bear the kinds of analytical and strategic thinking that prior training and increased maturity make possible to » define problems, » develop possible solutions, » and improve designs?	» How do the structures of organisms enable life's functions?" » How are the characteristics from one generation related to the previous generation? » How do organisms obtain and use the energy they need to live and grow? » How do matter and energy move through ecosystems?" » How do organisms interact with the living and non-living environment to obtain matter and energy?" » How can there be so many similarities among organisms yet so many different plants, animals, and microorganisms? » How does biodiversity affect humans?" » How can they bring to bear the kinds of analytical and strategic thinking that prior training and increased maturity make possible to › define problems, › develop possible solutions, › and improve designs?
Beginning of the Year Self-Reflection Questions:	
10th Grade Teacher: » How do I normally tier instruction to bridge the increased rigor and complexity between the 9th grade standards and the 10th grade standards? » What strategies and scaffolds do I already know that I can draw on to support students who may have fallen behind? » What additional information/data do I need about students' strengths and weaknesses?	
Notes:	

Beginning of the Year Collaborative Conversation Starters	Notes
» What science objectives were addressed really well during the past school year? » What science objectives were not addressed during the past school year? » What Science and Engineering Practices were not addressed during the past school year? » What Crosscutting Concepts might be used to bridge connections between 9th and the 10th grade science objectives? » What strategies did the 9th grade teacher use that were successful? » Might these strategies be incorporated into 10th grade instruction?	
Cross Cutting Concepts Checklist 1. Patterns 2. Cause and Effect 3. Scale, proportion, and quantity 4. Systems and system models 5. Energy and matter 6. Structure and function 7. Stability and change **Practices Checklist** 1. Asking questions (for science) and defining problems (for engineering) 2. Developing and using models 3. Planning and carrying out investigations 4. Analyzing and interpreting data 5. Using mathematics and computational thinking 6. Constructing explanations (for science) and designing solutions (for engineering) 7. Engaging in argument from evidence 8. Obtaining, evaluating, and communicating information	

On-Going Self-Reflection Questions	Notes
» How am I monitoring students' progress throughout the year? » What strategies and scaffolds am I using to support students who may need additional assistance?	

For grade 10 collaborative conversations with grade 11

In grade 10, instructional time supports students using science and engineering practices to formulate answers to questions such as	In grade 11, instructional time supports students using science and engineering practices to formulate answers to questions such as
How do the structures of organisms enable life's functions?" How are the characteristics from one generation related to the previous generation? How do organisms obtain and use the energy they need to live and grow? How do matter and energy move through ecosystems?" How do organisms interact with the living and non-living environment to obtain matter and energy?" How can there be so many similarities among organisms yet so many different plants, animals, and microorganisms? How does biodiversity affect humans?" How can they bring to bear the kinds of analytical and strategic thinking that prior training and increased maturity make possible to define problems, develop possible solutions, and improve designs?	Science courses will vary. Conversations regarding students' 11th grade science courses should include students' 10th grade math teachers as well as 10 grade science teachers.

Self-Reflection Questions:

10th Grade Teacher:

- Which of these topics had I hit really hard already?
- How were my students doing these topics when we transitioned to remote learning? How do I know?
- How engaged were my students with these topics during remote learning?
- How well did the remote learning resources provide opportunities for students to engage in science and engineering practices?
- How well did the remote learning resources provide opportunities for students to make connections through Crosscutting Concepts?
- Which topics/practices/crosscutting concepts did I plan to re-emphasize if I'd had time?
- Do any students stand out to me as needing more support in these areas? How do I know?

Notes:

Collaborative Conversation Starters	Notes
» What science objectives were addressed really well during the past school year? » What science objectives were not addressed during the past school year? » What Science and Engineering Practices were not addressed during the past school year? » What Crosscutting Concepts might be used to bridge connections between 10th and the 11th grade science objectives? » What strategies did the 10th grade teacher use that were successful? » Might these strategies be incorporated into 11th grade instruction?	

Appendix E - Physical Education Considerations

The COVID-19 pandemic has dramatically changed how schools operate and has illuminated the need to prioritize students' safety, health and well-being. As school districts create new instructional models for the 2020-2021 academic year, administrators and educators must consider students' physical, mental, and social-emotional health above all else. And, an important part of the solution must be physical education.

The impact of the COVID-19 pandemic does not change the goal of physical education; however, there are considerations that apply in implementing programming. This document is an effort to identify those considerations based on two potential reentry scenarios in the fall as identified by the West Virginia Department of Education: Physical Education teachers are adept at prioritizing students' safety, health and well- being and should be well equipped to adapt their instruction to the decided upon scenario their local county adopts or designs. Physical Education considerations addressed in this document provide considerations for two scenarios, but are adaptable by counties to meet local educational needs. The two reentry scenarios addressed are as follows:

- Safer at School/ Safer at Home Scenario: In-school instruction with physical distancing
- Blended learning Delivery Scenario (defined as a combination of in-school instruction with physical distancing and distance learning)

Physical Education Physical Environment Considerations:

- Consult with local health department guidance on allowable instructional space approved for delivering physical education.
- Select a location for physical education instruction where students and staff can respect physical distancing guidelines. Instructional Considerations.
- Classes should not be combined, and class size should not be increased for physical education instruction. More space for instruction may be required for physical education class due to increased respiration of students when participating in moderate-to-vigorous physical activity.
- Evaluate available outdoor spaces on school property. When possible, use outdoor spaces for physical education instruction. When outdoors, avoid the use of playground equipment, benches, or other permanent structures unless they can be properly sanitized.
- Ensure that physical education teachers are familiar with the classrooms and spaces where instruction will be delivered so they may adjust their lessons and activities appropriately based on the space available.
- If the use of gymnasium or multipurpose room for is permitted for instruction, keep the doors and windows open if possible, to maximize circulation and air flow to accommodate for increased respiration by students while participating in physical activity.
- Consider allowing students to come to school dressed in clothes that are appropriate for participation in physical education, whether indoors or outdoors.
- Plan to incorporate marked off areas (e.g., poly spots, cones, visual aids, signs) to ensure physical distancing among students and reduce cross contamination

Physical Education Equipment and Sanitization Considerations

- Consult with local health department guidance on proper physical education equipment sanitation procedures.
- Inventory physical education equipment at the school to identify which pieces of equipment can be easily and effectively sanitized.
- If there is not equitable access to equipment for all students or if equipment cannot be properly cleaned and disinfected between classes, avoid the use of equipment altogether.
- Encourage students and staff to use individual water bottles in lieu of water fountains.

Physical Education Face to Face Instructional Considerations

- Continue to address the WVBE Wellness Education standards for K-12. Educators may need to prioritize standards and shift the focus of their curriculum to address physical fitness standards, responsible, personal, and social behaviors standards and physical activity standards and incorporate activities for development of movement forms/motor skills that are safe and appropriate.
- Use games and activities that require no physical contact and do not require students to be in close physical proximity to each other.
- Focus more on individual pursuits or skills rather than traditional team sports or activities.
- Include opportunities for student choice and incorporate student-suggested activities when appropriate.
- Ensure lessons are planned around the available space for instruction.

Physical Education Blended Model Instructional Considerations

- Consider assigning tasks for at-home completion and then have students apply the knowledge gained in the school setting.
- Consider a flipped classroom approach where students first learn about a topic at home and then come prepared to learn more about it in class.
- Allow for optimal student choice and provide opportunities for students to engage with teachers directly and often. This will be crucial to keep students motivated. Additionally, students are more interested in seeing videos created by their own teachers than shared videos created by other teachers.
- Consider the use of fitness/ activity logs to allow students to track engagement in physical activity pursuits and set fitness goals.
- Provide opportunities for students to design, monitor, and evaluate their own physical activity preferences.

Appendix F – Social Studies Critical Prerequisite Skills

Introduction

West Virginia's College- and Career-Readiness Standards have been developed with the goal of preparing students for a wide range of high-quality, post-secondary opportunities. Specifically, college- and career-readiness refers to the knowledge, skills, and dispositions needed to be successful in higher education and/or training that lead to gainful employment. The West Virginia College- and Career-Readiness Standards establish a set of knowledge and skills that all individuals need to transition into higher education or the workplace, as both realms share many expectations. All students throughout their educational experience should develop a full understanding of the career opportunities available, the education necessary to be successful in their chosen pathway, and a plan to attain their goals.

West Virginia's College- and Career-Readiness Standards for Social Studies promote proficiency in civics, economics, geography, and history. Students will develop problem solving and critical thinking skills independently and collaboratively as they engage in informed inquiry in social studies. College- and career-readiness is supported in social studies as students acquire and further develop their abilities to be critical consumers of what they read or hear and informed sources when they write or speak.

The overarching goal was to build a rigorous, relevant, challenging and developmentally appropriate social studies curriculum that prepares students for college- and career-readiness. West Virginia educators played a key role in shaping the content standards to align with the best practices in the field of social studies education. The contributions of these professionals were critical in creating a policy that is meaningful to classroom teachers and appears in a format that can easily be used and understood.

How to Use this Resource

The following discussion guide can be used to support individual reflection and to enhance collaborative conversations between educators regarding students' progression through the grade-level standards and the gaps that may be present during the next academic year.

Support students progressing to the next grade level and their new teacher by:

- examining the critical pre-requisite skills in the grade level you teach compared to those in the ***next*** grade level
- reflecting on how each skill was addressed during the year and how students were progressing with each skill
- answering the reflection questions and sharing data and insights with students' teacher(s) in the next grade level
- engaging in collaborative conversations with your students' teacher(s) in the next grade level regarding students' progress with critical skills and specific standards and sharing strategies and techniques for accelerating students' literacy achievement

Support new students by:

- examining the critical pre-requisite skills in the grade level you teach compared to those in the grade level ***before*** it
- reflecting on the nuances you see between the two grade levels and the strategies and techniques you use to support students' progression with skills and standards each year
- answering the reflection questions and gathering data about incoming students' skill progression, engagement levels, and interests from their previous teacher(s) as well as from students, families, and other sources of student data
- engaging in collaborative conversations with students' teacher(s) in the previous grade level regarding students' progress with critical skills and specific standards and sharing strategies and techniques for accelerating students' literacy achievement

The following four areas of social studies form all the courses in grades K-8 and the majority of the high school courses that are not content specific (e.g. geography and economics):

Civics

Civics addresses both citizenship and political systems. Citizenship education prepares students to be informed, active and effective citizens who accept their responsibilities, understand their privileges and rights and participate actively in society and government. To be successful participants in society, students must understand how to build social capital (a network of social relationships) that encourages reciprocity and trust, two characteristics of civic virtue and good citizenship. Students must be able to research issues, form reasoned opinions, support their positions and engage in the political process. Students exercise tolerance and empathy, respect the rights of others, and share a concern for the common good while acting responsibly with the interests of the larger community in mind. Students must learn and practice intellectual and participatory skills essential for an involved citizenry. To develop these skills, the curriculum must extend beyond the school to include experiences in the workplace and service in the community. While studying political systems, students develop global awareness and study the foundations of various world governments and the strategies they employ to achieve their goals. With respect to the United States, students learn the underlying principles of representative democracy, the constitutional separation of powers and the rule of law. Students learn the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States. Students recognize the need for authority, government and the rights and responsibilities of citizens.

Economics

Economics analyzes the production, allocation, distribution and use of resources. The economic principles include an understanding of scarcity and choice, productivity, markets and prices, supply and demand, competition, role of government, international trade factors and consumer decisions in a global economy. Understanding economic principles, whole economies and the interactions between different types of economies helps students comprehend the exchange of information, capital and products across the globe. Learners investigate economic principles and their application to historical situations. Learners will work cooperatively and individually to analyze how basic economic principles affect their daily lives. Students become financially responsible by examining the consequences of and practicing personal financial decision-making.

Geography

Geography encompasses physical and human systems and the interactions between them on local and global scales. People interact with the natural world in culturally distinct ways to produce unique places, which change over time. New technologies and perspectives of geography provide students with an understanding of the world, and the ability to evaluate information in spatial terms. The geography standards stress the world in which we live and the role of the U.S. in the global community. Students use geographic perspectives and technology to interpret culture, environment and the connection between them. Students collaborate with one another and work individually using geographic skills and tools to ask geographic questions based on the five themes of geography (location, place, human-environmental interaction, movement and regions). They acquire the necessary information, organize and analyze the information and respond to those geographic questions. Students examine the varying ways in which people interact with their environments and appreciate the diversity and similarities of cultures and places created by those interactions.

History

History organizes events and phenomena in terms of when they occurred and examines where, how and why they took place. Students study how individuals and societies have changed and interacted over time. They organize events through chronologies and evaluate cause-and-effect relationships among them. Students analyze how individuals, groups and nations have shaped cultural heritages. They gather historical data, examine, analyze and interpret this data, and present their results in a clear, critical manner. Students study origins and evolutions of culture hearths, settlements, civilizations, states, nations, nation-states, governments and economic developments. Through history, students understand the identity and origins of their families, communities, state and nation. Through history, students recognize the influence of world events on the development of the United States and they evaluate the influence of the United States on the world. Understanding the past helps students prepare for today and the events of the future.

College- and Career-Readiness Indicators for Social Studies

The grades K-12 standards define what students should know, understand, and be able to do by the end of each grade band. They correspond to the College- and Career-Readiness Indicators for Social Studies by grade band (K-2, 3-5, 6-8, and 9-12). The College- and Career-Readiness Indicators and grade-specific standards are necessary complements – the former providing broad standards, the latter providing additional specificity – that together define the skills and understandings that all students must demonstrate.

Integration of Literacy in Social Studies

Literacy strategies and skills are applied as students acquire information and communicate their learning and understanding of social studies. Integration of literacy in social studies is critical for student success. It is essential that literacy strategy and skill instruction be purposefully and appropriately planned and embedded within social studies instruction.

Questions to Guide Reflection and Discussion

Beginning of the Year Self-Reflection Questions:
» What nuances do I see between the critical skills in the grade level I teach and the critical skills of the previous grade level?
» What specific standards or clusters of standards create the nuances in critical skills between these grade levels?
» How do I normally tier instruction to bridge the increased rigor and complexity between the standards in grade level I teach and the standards in the previous grade level?
» What strategies and scaffolds do I already know that I can draw on to support students who may have fallen behind?
» What additional information/data do I need about students' strengths and weaknesses?
» What equitably measures are in place or need considered to ensure all learners have the resources needed to be successful?
» What technology equitability issues will need to be addressed to ensure all students have access to instructional materials and understand how to use technology tools effectively?
Beginning of the Year Collaborative Conversation Starters
» What social studies standards were not addressed during the past year?
» How do the components of the four domains align with my content standards?
» What strategies were used by my colleagues in lower grades that may work with my students and content standards?
» What components of the four domains were not taught in the previous year?
» Which components of the four domains could be taught in a cross-curriculum format collaborating with ELA, science, and math teachers?
On-Going Self-Reflection Questions
» How am I monitoring student progress throughout the year?
» What strategies are being used to support students who may additional assistance?
» How will I ensure all content standards are taught by the end of the school year?
» What resources and professional development do I need to support my students?

Additional Supports for Reflection and Collaborative Conversations

- Policy 2520.4 - West Virginia College- and Career-Readiness Standards for Social Studies
- WVDE Educator Hub Middle and Secondary Resources

Grade 6 to Grade 8

West Virginia's College- and Career-Readiness Standards for Social Studies promote proficiency in civics, economics, geography, and history. Students will develop problem solving and critical thinking skills independently and collaboratively as they engage in informed inquiry in social studies. College- and career-readiness is supported in social studies as students acquire and further develop their abilities to be critical consumers of what they read or hear and informed sources when they write or speak.

Grade 6 through 8 Indicators:
Develop questions through investigations. Apply disciplinary concepts and tools. Evaluate sources and use evidence. Communicate conclusions and take informed action.

Civics	**Economics**
» Distinguish the powers and responsibilities of citizens, political parties, interest groups and the media. » Explain specific roles played by citizens (such as voters, jurors, taxpayers, members of the armed forces, petitioners, protesters, and office-holders). » Examine the origins, purposes, and impact of constitutions, laws, treaties, and international agreements. » Explain the powers and limits of the three branches of government. » Explain the origins, functions, and structure of government with reference to the U.S. Constitution, state constitutions, and selected other systems of government. » Assess specific rules and laws (both actual and proposed) as a means of addressing public problems. » Compare historical and contemporary means of changing societies and promoting the common good.	» Explain how economic decisions affect the well-being of individuals, businesses, and society. » Evaluate alternative approaches or solutions to current economic issues in terms of benefits and costs for different groups and society as a whole. » Explain the roles of buyers and sellers in product, labor, and financial markets. » Explain how changes in supply and demand causes changes in prices and quantities of goods, and services, labor, and credit. » Analyze the role of innovation and entrepreneurship in a market economy. » Describe the roles of institutions such as corporations, non-profits, and labor unions in a market economy. » Explain how inflation, deflation, and unemployment affect different groups. » Explain barriers and benefits to trade and how they affect individuals, businesses, and society.

Geography	History and Literacy
» Construct maps to represent and explain the spatial patterns of cultural and environmental characteristics. » Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and changes in their environmental characteristics. » Use paper based and electronic mapping and graphing techniques to represent and analyze spatial patterns of different environmental and cultural characteristics. » Explain how cultural patterns and economic decisions influence environments and the daily lives of people in both nearby and distant places over time. » Explain how changes in transportation and communication technology influence the spatial connections among human settlements and affect the diffusion of ideas and cultural practices. » Analyze the ways in which cultural and environmental characteristics vary among various regions of the world. » Explain how global changes in population distribution patterns affect changes in land use in particular places	» Analyze connections among events and developments in broader historical contexts. » Use questions generated about individuals and groups to analyze why they, and the developments they shaped, are seen as historically significant. » Analyze multiple factors that influences people's perspectives during different historical eras. » Analyze how people's perspectives have changed and how those perspectives have influenced what information is available in the historical sources they created. » Use questions generated about multiple historical sources to identify further areas of inquiry and additional sources. » Explain multiple causes and effects of events and developments in the past. » Evaluate the relative influence of various causes of events and developments in the past. » Organize applicable evidence into a coherent argument about the past. » Read and comprehend history/social studies texts at or above grade level text complexity band independently and proficiently. » Write informative/explanatory texts, including narration of historical events. » Conduct short research projects to answer a question, drawing on several sources.

Grade 9 to Grade 12

The WVCCRS for ELA support a vertical progression of learning meaning that every standard plays a role in the development of critical prerequisite skills for the following year. The chart below highlights the nuances between grade levels and is intended to spark reflection and discussion for the purpose of supporting students' literacy development.

Grade 9 through 12 Indicators:
» Develop questions through investigations.
» Apply disciplinary concepts and tools.
» Evaluate sources and use evidence.
» Communicate conclusions and take informed action.

Civics	**Economics**
» Distinguish the powers and responsibilities of local, state, tribal, national, and international civic and political institutions. » Analyze the roles of citizens in the U.S. political system. » Explain how the U.S. Constitution establishes a system of government that has powers, responsibilities, and limits that have changed over time and that are still contested. » Critique relationships among governments, civil societies, and economic markets. » Evaluate the social and political systems that, in different contexts, times, and places, promote civic virtues and demonstrate democratic principles. » Analyze the impact and the appropriate roles of personal interests and perspectives on the application of civic virtues, democratic principles, constitutional rights, and human rights. » Evaluate multiple procedures for making governmental decisions at all levels. » Analyze how people use and influence local, state, national, and international laws in order to address a variety of public issues. » Evaluate public policies in terms of intended and unintended outcomes, and their related consequences. » Analyze historical, contemporary, and emerging means of changing societies, while still promoting the common good, and protecting rights.	» Analyze how incentives influence choices that may result in policies with a range of costs and benefits for different groups. » Evaluate the extent to which competition among sellers and among buyers exists in specific markets. » Describe the consequences of competition. » Use benefits and costs to evaluate the effectiveness of government policies to improve market outcomes. » Describe the roles of banks and other financial institutions. » Describe the roles institutions play in such things as clearly defined property rights and the rule of law in a market economy. » Use current data to explain the influence of changes in spending, production, and the money supply on various economic conditions. » Use key economic indicators to analyze the current and future state of the economy. » Evaluate the selection of monetary and fiscal policies in a variety of economic conditions. » Explain why advancements in capital goods and human capital increase economic growth and standards of living. » Explain how current globalization trends and policies affect economic growth, labor markets, rights of citizens, the environment, and resources and income distribution in various nations.

Geography	History and Literacy
» Use geospatial and related technologies to create maps to display and explain the spatial patterns of cultural and environmental characteristics. » Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their political, cultural, and economic dynamics. » Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them. » Evaluate how past political and economic decisions have influenced cultural and environmental characteristics of various places and regions. » Evaluate the impact of human settlement activities on the environmental and cultural characteristics of specific places and regions. » Explain how changes in transportation and communication technology influence the spatial connections among human settlements and affect the diffusion of ideas and cultural practices. » Analyze the reciprocal nature of how historical events and the spatial diffusion of ideas, technologies, and cultural practices have influenced migration patterns and the distribution of human population. » Evaluate how economic globalization and the expanding use of scarce resources contribute to conflict and cooperation within and among countries. » Evaluate the effects of human-made and natural catastrophes on global trade, politics, and human migration.	» Evaluate how historical events and developments were shaped by unique circumstances of time and place as well as broader historical contexts. » Use questions generated about individuals and groups to assess how the significance of their actions changes over time and is shaped by the historical context. » Analyze how historical contexts shaped and continue to shape people's perspectives. » Analyze the ways in which the perspectives of those writing history shaped the history that they produced. » Explain how the perspectives of people in the present shape interpretations of the past. » Analyze the relationship between historical sources and the secondary interpretations made from them. » Detect possible limitations in various kinds of historical evidence and differing secondary interpretations. » Use questions generated about multiple historical sources to pursue further inquiry and investigate additional sources. » Critique the validity of the historical sources used in a secondary interpretation. » Distinguish between long-term causes and triggering events in developing a historical argument. » Integrate evidence from multiple relevant historical sources and interpretations into a reasoned argument about the past. » Critique the central argument in secondary works of history on related topics in multiple media in terms of their historical accuracy. » Read and comprehend history/social studies texts at or above grade level text complexity band independently and proficiently. » Write informative/explanatory texts, including the narration of historical events. » Conduct short, as well as more sustained, research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Appendix G – Arts Education Considerations for Re-entry in West Virginia Schools

The delivery of instruction and the shape of programming will be significantly impacted by the dynamics of COVID-19. We know this disease spreads from person to person through respiratory droplets in the air and certain activities, such as singing and playing certain instruments, produces an increased amount of respiratory droplets. Arts education is a very important component in a student's educational journey and thus we must be creative in how to provide this instruction in a manner that minimizes a student's exposure to respiratory droplets. Arts educators are adept at identifying students' talents, abilities and potential but now more than ever must demonstrate flexibility and innovation as they determine how they will provide meaningful instruction within the framework of the reentry scenario a local county adopts or designs.

When designing instruction and programming, consider that "expressing" is a key and critical word in making, creating, and performing art. Arts educators may also want to consider designing therapeutic activities for each arts discipline that will ease students' reentry into school. Doing so will acclimate them to the instructional environment chosen by the school or county (i.e. face-to-face or blended).

This document provides a broad overview of the arts and does not specify how to address the unique characteristics that each arts discipline possesses. It is an effort to examine considerations based on two potential reentry scenarios as identified by the West Virginia Department of Education.

Two reentry scenarios could be:

- In-Person Scenario
- Blended Instruction Scenario (defined as a combination of in-school instruction and virtual learning)

Arts Education General Considerations:

- Consult with local health department for guidance on allowable instructional space approved for delivering arts education.
- Ensure that all teachers, both general classroom and arts specialists, are familiar with the classrooms and spaces where instruction will be delivered so they may adjust their lessons and activities appropriately based on the space available.
- Encourage discussion among teachers, administrators, and decision makers focusing on the size of arts classrooms and rehearsal spaces being larger than core classrooms and what areas in the school can be combined or modified to accommodate this.
- Plan to incorporate marked off areas (e.g. floor icons/markings, cones, visual aids, signs) to ensure social distancing among students and reduce cross contamination.
- Encourage social distancing for class, rehearsal, and performance.
- Reorganize, if possible, for smaller classes.
- Promote social distancing when moving students to different areas.
- Face student chairs/desks in staggered rows in the same direction as much as possible. Conductors of music groups should face the ensemble from a distance of 10-20 feet and possibly wear goggles or install an acrylic shield.

- Consider plans that enhance the arts and that does not limit the availability of arts course options
- Limit activities that require close contact or potential contact with another person.
- Open windows and doors to try to maximize improved air circulation. When possible, hold classes in outdoor spaces. In keeping with fire/safety regulations, remember not to leave doors/windows open after the class/rehearsal is finished.
- Allow sufficient time between classes to allow for cleaning and disinfection of shared materials.

ARTS EDUCATION: In-Person Instruction

Arts Education Equipment and Sanitization Considerations

- Consult with local health department for guidance on proper arts education materials and equipment sanitation procedures.
- Inventory arts education materials and equipment at the school to identify which pieces can be easily and effectively sanitized (e.g. instrument mouth pieces, classroom set of colored pencils/crayons, scissors). Consider creating personal student "packets" of required or often used materials (e.g. scissors, crayons).
- If there is not equitable access to materials and equipment for all students or if they cannot be properly cleaned and disinfected between classes, avoid their use altogether.
- Encourage students and staff to use individual water bottles in lieu of water fountains.

Arts Education Face to Face Instructional Considerations

- For general music and elementary visual art, theatre and dance instruction, plan games and activities that require no physical contact and do not require students to be in physical proximity to each other.
- Focus more on individual pursuits or skills rather than traditional group or corporate activities.
- Include opportunities for student choice and incorporate student-suggested activities when appropriate.
- Consider using technology to broadcast instruction to socially distanced students (e.g. large screens for projection of instructional materials, microphones (lavalier)/megaphones). Encourage students to perform and record their performances.

ARTS EDUCATION: Blended Model Instructional Considerations

- Consider assigning tasks for at-home completion or practice and then have students apply that knowledge in the school setting.
- Consider a flipped classroom approach where students first learn about a topic at home and then come prepared to learn more about it in class.
- Allow for optimal student choice and provide opportunities for students to engage with teachers directly and often. This is critical in keeping students motivated. Additionally, students are more interested in seeing videos created by their own teachers rather than shared videos created by other teachers or possibly ones commercially produced.
- Consider using individualized programs that require multiple activities. Allow for personal choice with appropriate record keeping (e.g. personalized logs, goal setting).

- Make efforts at every level to assist students in creating personal activities that include logging and reporting of learning processes, achievement of standards and assessment benchmarks.
- Consider Blended Instruction/Flipped classroom settings utilizing various technology platforms.

Additional Considerations:

Music Education

- Limit songs/dances with touching and singing/playing in circles.
- Provide lessons that limit instruments/voices (solos, small ensemble, sectional rehearsals, etc.).
- Utilize technology to broadcast instruction to socially distanced students (large screens for projection of instructional materials/music, speakers to project accompaniment, microphones / instructions, etc.).
- In addition, introduce other instrument classes that do not require strong exhalation - string and percussion instruments, possibly including ukulele and guitar.
- Explore other avenues of music learning besides singing or playing (music theory, music appreciation, songwriting, music history).
- Incorporate Blended Learning/Flipped classroom utilizing technology platforms.
- Use individualized programs requiring multiple activity stations. Allow for personal choice with appropriate record keeping (personalized logs, goal setting, etc.).
- Record class rehearsals to share with students who cannot attend school.
  - Show Choir and Chorus
    - *Work with local educators, county administrators, and the local health department to develop plans for Show Choir, Chorus, and other music-based courses.*

Theatre Education

- Consider plays with smaller casts (or A/B casts).
- Use of larger stage performance and rehearsal equipment that cannot be disinfected should not be used. Curtains and drops should be flown out or drawn open during rehearsals.
- When able to use live music, follow guidelines from local health department and state officials.
- Cast understudies and swing performers to allow for missed rehearsals/performances for students who may need to be absent.

Visual Art Education

- When hands-on art-making is not feasible, lessons supporting the art curriculum should focus presenting, responding, and connecting, as well as digital art lessons.
- If centers are used for visual art instruction, students should remain in a designated center for the duration of that class or project.
- When possible, blended instruction/flipped instruction can be used to limit close contact during instruction, especially for demonstrations.

Dance Education

- Design movement activities so that students are all facing the same direction and able to remain in their designated space when possible.
- Limit physical contact with students for alignment corrections.
- Limit activities that require direct or indirect contact including: partnering, tactile cueing, direct floor work, touching the same equipment or traveling across the floor.

- Promote appropriate social distancing between dancers side by side in one line and allow each group to complete the combination to the end of the room prior to the next group starting.
- Consider a rotational plan for dividing student instruction into various grouping stations; performing, reading, writing, and observing so that not all students need to be in motion on the same day.

Performing and Visual Art Productions

- Consider modifying some productions to podcast or video broadcast events to minimize concerns of social distancing at a live performance.
- Eliminate post performance gatherings of performers with family and friends.
- Place artwork exhibits far enough apart to allow for social distancing.
- Allow only limited numbers to view visual art at any given time.
- Discourage works that encourage touching or handling by multiple individuals.
- Consider creating and uploading artwork in various online platforms and technologies to create virtual art galleries.

Appendix H – Driver Education Considerations for Reentry in West Virginia Schools

Driver education, naturally, brings individuals into close proximity in the training process. Administering and delivering driver education courses will not be the same as before. While we must endeavor today to reduce the risk of spreading the virus, we must also be vigilant in the future to reduce the possibility of additional waves. Practices established today can help to manage and minimize the risks of COVID-19 or similar outbreaks. Counties should consult with their local health department regarding the delivery of driver education. This document provides considerations for reentry regarding the delivery of Driver Education in West Virginia schools.

Disclaimer:
This is not professional medical advice. Counties should seek approval from their local health department prior to conducting training. Should a county choose to conduct driver education courses, these considerations are offered to administrators and driver educators for informational purposes only. The reader is responsible for determining what is appropriate and prudent for their program while following local health department and State and Federal guidelines.

Considerations for all modes of driver education delivery

- Seek approval from your local health department prior to conducting any training.
- Check frequently for updates from local, state and federal government agencies/organizations.
- Before classroom and Behind The Wheel (BTW) instruction begins, consider screening instructors and students for COVID-19 symptoms.
- Discourage early arrival of students before classroom and BTW sessions begin and adhere to social distancing recommendations.

Considerations for Behind the Wheel instruction and practice driving

- Require teachers and students to wear face coverings over the nose and mouth.
- Conduct shorter lessons so that you reduce the time that the students and instructors are together in the classroom or in the vehicle.
- Require students to wash hands before and after BTW driving sessions.
- Before and after each BTW driving lesson, thoroughly clean the following with alcohol-based cleaning products: steering wheels and steering column controls, dashboard controls, seats, seatbelts, gearshifts, keys, doo handles, etc.
- Avoid additional students in the car for observation time. Consider allowing no more than one student in the center back seat.
- Avoid using the air recirculation feature which may increase the spread of the virus.
- Ensure adequate ventilation by opening windows, as applicable.
- Assign students to driving pairs for observation and BTW practice driving.
- Examine how the parent/guardian, with proper guidance in partnership with the instructor, may provide additional hours of BTW instruction/practice and observational time.

Considerations to augment Behind the Wheel Instruction

- Examine how multi-car range instruction may augment BTW instruction, if permitted and ensure social distancing protocols are maintained. Consider allowing no more than one student per vehicle. Use communication devices to interact with students, and follow cleaning protocols to thoroughly clean the vehicle/equipment prior to and following range instruction.
- Examine how driving simulation instruction may augment BTW instruction, if permitted. Follow cleaning protocols to thoroughly clean simulators/equipment prior to and following instruction.

Considerations for alternate methods of classroom delivery

- Consider a mix of the following classroom delivery methods.
- Virtual classroom sessions utilizing the many technology platforms available.
- Computer-based learning approaches.
- Individual student activities and assignments (do not assign groups to activities).
- Parent/guardian-led activities and assignments.

Appendix I – Physical Activity Considerations for Reentry in West Virginia Schools

The delivery of physical education instruction will be significantly impacted by the dynamics of COVID-19. Notwithstanding, physical activity in the form of recess or classroom based physical activity should continue as much as possible if schools are operating under a model of in-school instruction with physical distancing. Recess and classroom based physical activity helps students achieve the recommended 60 minutes of physical activity per day for children and adolescents, which can improve strength and endurance, enhance academic achievement, and increase self-esteem. Recess also helps students practice social skills such as cooperation, following rules, problem-solving, negotiation, sharing, and communication. Opportunities for free play, to engage in physical activity, and to practice social skills are especially important during the COVID-19 pandemic.

Recess / Informal Physical Activity Considerations

- Evaluate available indoor and outdoor spaces on school property that can be used for recess.
- Consult with local health department guidance on allowable space approved for offering physical activity.
- Select a location for physical activity where students and staff can respect physical distancing guidelines.
- Classes should not be combined during recess. Consider implementing a recess schedule to address overcrowding and maintain physical distancing requirements.
- Identify multiple areas where recess can be held for different cohorts of students to minimize crowding. Whenever possible, use outdoor spaces for recess.
- Give students guidance on how to safely transition between areas while still maintaining physical distancing. Plan time to practice these transitions with students.
- Provide adequate adult supervision for recess.
- If playground equipment is used, it requires normal, routine cleaning. Targeted disinfection may be appropriate for high-touch surfaces like railings.
- Have students and staff wash or sanitize hands before and after recess.
- Designate zones to help students identify how to safely comply with physical distancing guidelines and to provide sufficient opportunities for free choice during recess.
- Provide recess or free time to engage in safe physical activity daily for elementary students.
- Recess should provide opportunities for all students to be active and allow for free choice by students.
- Encourage recess games and activities that do not require physical contact or for students to be in close physical proximity with each other.
- Limit the use of recess play equipment and eliminate the use of equipment that would be passed between or shared by multiple students.
- Do not withhold recess as punishment for a student.

Classroom-Based Physical Activity Considerations.

While maintaining physical distancing measures is critical in mitigating the spread of COVID-19, classroom teachers can still provide opportunities for students to be active throughout the school day (in addition to physical education and recess). Incorporating activity breaks or brain boosts during classroom learning can increase the amount of time students are physically active throughout the day and limit the amount of time they are sedentary.

Classroom-based physical activity improves students' concentration and attention, behavior, motivation and engagement in the learning process, and academic performance. Providing opportunities for classroom-based physical activity can be used as a strategy to mitigate feelings of stress and anxiety brought on by the COVID-19 pandemic.

- Evaluate available classroom space and outdoor spaces on school property that can be used for physical activity and physically active academic integration.
- Give students guidance on how to safely participate in classroom based physical activity while still maintaining physical distancing. Plan time to practice these transitions with students.
- Promote mindfulness activities to support student abilities to cope with stress and anxiety.
- Encourage activities that do not require physical contact or for students to be in close physical proximity with each other.
- Disinfect equipment/manipulatives that are passed between or shared by multiple students between uses.

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