



Course Syllabus: Teaching Math Methods in Elementary School
West College of Education
EDUC 4043, Section 101
Fall 2025

Contact Information

Instructor: Dr. Dittika Gupta

Office: Bridwell BH 220

Student Drop-in Hours: Tuesday 11:00am-12:00pm, Wednesday -10:30-11:30am and Thursday 11:00-12:00pm and 1:00-3:00pm. I am also happy to meet outside of office hours if there is a need. Don't hesitate to contact me to find a convenient time for both of us.

Office phone: (940) 397-4269

E-mail: dittika.gupta@msutexas.edu

Instructor Response Policy

We will be working and communicating constantly throughout the semester. Email is great however you will also be a part of class GroupMe which will provide more flexibility in communication. I will try my best to answer all emails and texts within 24 hours, however you will definitely get a response within 48 hours (2 days). Any emails or texts received during weekends will not receive a response till the following Monday. No emails or texts will be answered over the weekend.

Textbook & Instructional Materials

Open Education resource materials will be used in the class. There is no required textbook for the class.

Course Description

These field-based courses focus on elementary and middle school mathematics, mathematics pedagogy with emphasis on instructional strategies and models, the use of technology in the learning/teaching process, effective practices, professionalism, curriculum, and lesson design. Different teaching strategies include appropriate use of creative approaches to the learning/teaching process, cooperative learning, direct instruction, inquiry, concept attainment, etc. An important component of this field-based

Course Objectives/Learning Outcomes/Course Competencies

1. Learners are able to describe learning and thinking in elementary and middle mathematics.
2. Learners will be able to develop curriculum and use effective instructional planning skills.

3. Learners will be able to develop appropriate assessment tools to assess students learning.
4. Learners will be able to use assessment data to design appropriate learning activities.
5. Learners will be able to develop lesson plans that involve students in an active learning environment.
6. Learners will be able to develop and implement effective teaching strategies.
7. Learners will be able to develop lesson plans/units that incorporate national standards in mathematics and technology applications.
8. Learners will be able to develop lesson plans/units that incorporate state standards in mathematics and technology applications.
9. Learners will be able to develop and implement learning environments that utilize various teaching/learning strategies.

Learners will be able to develop learning activities that involve the infusion of technology.

See Appendix A for a complete list of standards, competencies, and other expectations

Study Hours and Tutoring Assistance

The TASP offers a schedule of selected subjects tutoring assistance. Please contact the TASP, (940)397-4684, or visit the ASC homepage for more information.

[Tutoring & Academics Supports Programs](#)

Student Handbook

Refer to: [Student Handbook](#)

Academic Misconduct Policy & Procedures

Academic Dishonesty: Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individual's to whom credit is given). Additional guidelines on procedures in these matters may be found in the Office of Student Conduct.

[Office of Student Conduct](#)

Services for Students with Disabilities

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make application for such assistance through Disability Support Services, Student Wellness Center

Phone: 940-397-4140

Email: disabilityservices@msutexas.edu

Website: [DSS Webpage](#)

Current documentation of a disability will be required in order to provide appropriate services, and each request will be individually reviewed.

Grading/Assessment

Table 1: Points allocated to each assignment

Assignments	Points
Technology Introduction Presentation	50
Instructional Strategy Presentations	75
Vertical Alignment Assignment	50
Reflections	40
Lesson plan	100
Lesson Observation	100
Teaching Reflection	50
Unit Plan Part 1 and 2	50
Full Unit Plan	150
Classroom Participation and In-class Activities	150
Disposition- pre, post, and lesson plan	35
Total Points	950

***Grading points may change as per the needs of the class and students.**

Table 2: Total points for final grade.

Grade	Percentage
A	90% - 100%
B	80% - 89.99%
C	70% - 79.99%
D	60% - 69.99%
F	Below 59%

***Note that an "A" is 90% to 100%. There will be NO rounding and grades will be calculated with two decimal points.**

Technology Assignment

There is a technology assignment that engages and assesses your understanding of using teaching in the teaching and learning of mathematics. Details for the assignment will be on D2L and discussed in class.

Instructional Strategy Presentation

Each student will be doing a short presentation on two instructional strategies. Students will be given choice to choose from a variety of instructional strategies, and it will be due in-class. Details will be provided.

Written Assignments

There are some written assignments in this course that build your understanding of thinking about how children assimilate mathematics and also prepare you to

become aware of research-based practices in teaching mathematics. Details for assignments will be on D2L. Any questions can be asked via email or during class.

Expectations for written work:

Correct grammar, punctuation, and spelling are expected on all written assignments (although web discussions are not held to the high standard of a research project or other written assignment).

Written assignments should be:

- Done in Microsoft Word and turned in as an attachment in Dropbox on D2L or Converted to a PDF and turned in as an attachment in Dropbox on D2L.
- Discussions (if applicable) should be completed within the D2L discussion space and NOT uploaded as an attachment.

Lesson Planning

Teacher candidates must demonstrate the ability to plan, assess, and implement instruction. This begins in the Foundational block where the teacher candidates create and write lessons for effective teaching. Teacher candidates are required to develop lesson plans. The specific format can be adapted, but should always include the objectives, TEKS, procedures, materials/resources, assessments, and required components of the lesson plan. Student engagement is a key element in a good lesson with student learning and success as the goal.

Candidates must form assessment strategies to determine the extent to which students master the learning objectives. Candidates also describe the instructional delivery method addressing the following step-by-step procedures:

1. Questions and concerns listed in the directions given to you by your instructor
2. Setting purposes ("Today we will be...I want you to...because you will...")
3. Method(s) for engaging students in the lesson
4. Any questions asked during the lesson should be in bold
5. Higher order thinking reflected in questions
6. Instructional Strategies: Modeling, Discussion, "Hands-on", Inquiry, etc.
7. Grouping: when and how
8. Instruction that addresses learners' needs (ELLs, Special Education, 504, Gifted, Struggling Learner)
9. Closure

After teaching the lesson, candidates are then required to reflect on and explain:

- the lesson delivery and appropriateness of instructional strategies,
- the impact for future planning using evidence from gathered data and
- collaboration opportunities with the mentor teacher.

The skills acquired during lesson planning provide the foundation and are also built upon for unit planning and other key assessments.

Unit Plan

Unit plan is a culmination of three coherent lessons that are aligned with math standards. Students will be working on their unit plans and submit it as a final for the course. Details and detailed rubrics will be provided.

Extra Credit

Extra Credit opportunities will be given and will depend on the flow and needs of the class. Any change in this policy will be dependent upon opportunities and instructor preferences.

Late Work

Late work will receive a 25% deduction per day per assignment (including Saturday and Sunday). This means if the assignment is for 100 points, you can make a maximum score of 75 after one day, 50 after two days, 25 after three days, and zero after 4 days if all your answers are correct. *There is NO late work on discussion boards or quizzes! All this is non-negotiable!!! If there are any issues or you are confused about an assignment, contact me *BEFORE* the assignment is due (at least 24 to 48 hours before the assignment is due). Time shown on D2L, or email will be used.

Please note: Even though this is a face-to-face class, this class requires you to have access to a computer (with Internet access) to check for class news updates, materials, instructions, resources and upload your assignments in D2L. It is your responsibility to have (or have access to) a working computer in this class. *Assignments are due by the due date, and personal computer technical difficulties will not be considered reason for the instructor to allow students extra time for submission.

Make Up Work/Tests

There will be no make-up or resubmissions allowed on assignments, quizzes, discussion boards, or any other activity in class.

Class Participation

Students should participate in all the activities of this course. It is important that students meet all the deadlines as posted. In the case of any emergency situation (like death or illness in family, etc.) it is important that the student should report the same to the professor in a timely manner. It is your course, and the primary intention should be to reach the goals and acquire proficiency in the topics discussed in the course. Generally, students are graded on intellectual effort and performance rather than attendance, absences may lower the student's grade where class attendance and class participation are deemed essential.

Excessive tardiness or absence (as determined by the professor), disruptive attitude, or failure to consistently meet class requirements might result in instructor-drop, if required. Being repeatedly late for class will also result in a grade reduction regardless of other marks. Tardiness will result in loss of classroom disposition points and three instances of tardy arrival will be counted as one absence.

Each student brings a unique perspective and life experience to the learning environment and is expected to participate actively and thoughtfully by making pertinent contributions. All students are expected to read assignments and be prepared to discuss them. Note that you are provided with focus questions that are designed to structure your reading of the assigned texts. Moreover, the course instructor may assign additional readings. **Participating in class discussions and following expectations is a part of your grade.* Please come to class with questions or issues from the reading that you found central or worthy of further exploration. Students may also be asked to do activities and exercises related to the assigned readings or to lead discussions on a topic or reading. You will have many opportunities to participate in class and on D2L. These opportunities are a very important part of this course.

Throughout the course of your field observations, you will be submitting timelogs in TK20 that are sent to your cooperating teacher to verify your attendance and participation in the field. You must have at least 20 hours and they must be approved by the cooperating teacher. This needs to be done weekly and you need to verify that they have been approved by logging in to TK20 periodically and checking. Please DO NOT submit hours unless they have been checked by me. At least 10 hours of your time in the classroom must be spent engaging with students in instructional or educational activities, though you will likely spend more than 15 hours doing so. At the end of the course, date listed on the calendar, you need to upload a screen shot of every approved timelog to the appropriate dropbox in D2L. There is a place in TK20 where this is all on one screen so this will be one, maybe two pages that you submit.

Important Dates

Last day for term schedule changes: August 26-29. Check date on [Academic Calendar](#).

Deadline to file for graduation: September 23. Check date on [Academic Calendar](#).

Last Day to drop with a grade of "W:" November 25. Check date on [Academic Calendar](#).

Refer to: [Drops, Withdrawals & Void](#)

Desire-to-Learn (D2L)

Extensive use of the MSU D2L program. Each student is expected to be familiar with D2L as it provides a primary source of communication regarding assignments, examination materials, and general course information. You can log into [D2L](#) through the MSU Homepage. *If you experience difficulties, please contact the technicians listed for the program or contact your instructor.* ***Do not wait till the last minute to submit the assignment. Delays or sending through email will be counted late!**

Computers are available on campus in various areas of the buildings as well as the Academic Success Center. ****Again, your computer being down is not an***

excuse for missing a deadline!! There are many places to access your class! If you have technical difficulties in the course, there is also a student helpdesk available to you. The college cannot work directly on student computers due to both liability and resource limitations, however they are able to help you get connected to our online services. For help, log into [D2L](#).

Attendance

Absence Policy - Professional teachers are dependable, reliable, and responsible. Therefore, candidates are expected to be on time and in attendance at ***every*** class, and to stay for the ***entire*** class. *Tardiness, leaving early, and excessive absences (3) are considered evidence of lack of dependability, and are taken seriously. **Candidates will receive a grade of F on the third absence. If a candidate is taking 'blocked' courses that are taught at a Professional Development School, requiring field experience, the candidate will be dropped with an F from those classes as well.*

After an absence from the course, it is imperative that a student schedule an appointment with the course instructor to discuss attendance. Failure to schedule and attend a conference will result in the loss of classroom participation and disposition points and also in the overall grade being lowered by one letter. It is the candidate's responsibility to make up for any missed work. It is also expected that you will complete all course field experience hours in a professional manner. Professional conduct is expected when observing or participating in school settings (e.g., dressing appropriately, arriving on time, remaining for the entire pre-arranged time, not canceling, and demonstrating respect in all interactions with young people, parents, teachers, and staff). If you must miss your field experience for any reason, you are expected to call the school and the teacher you are working with ***before*** school begins for the day. You must also contact the course instructor by e-mail or phone to let me know you will not be present and arrange a time with me when we can discuss the most appropriate way to make up that absence. Excessive tardiness (determined by the professor) can be defined as an absence and subject to the absentee policy. Three instances of tardy arrival will be counted as one absence.

If a class member is absent, for whatever reason, that individual assumes responsibility for contacting the instructor to account for missed work and to turn in work. **It is impossible to provide a summary of all that takes place during any given class via email.** If a student is going to be absent, they have the responsibility to contact the instructor to turn in assignments and obtain copies of any handouts from the missed class. Tentative assignment due dates are listed on the course schedule. While the actual due dates may vary due to the flow of the class, all assignment due dates will be finalized and announced in class well in advance of the specific date. *Late work, unless arrangements are made by the student and approved **in advance** by the instructor, **will not be accepted for full credit.**

During your field observations, you are required to submit time logs in TK20 to your cooperating teacher for attendance and participation verification. You must accumulate a minimum of 50 hours total prior to clinical teaching, which need to be approved by the cooperating teacher. This should be done weekly, and you should periodically check TK20 to ensure that your time logs have been approved. For this course, a minimum of 20 hours in the classroom should be dedicated to engaging with students in instructional or educational activities, although you will likely spend more than 20 hours doing so. Prior to your clinical teaching experience, you should have at a minimum of 50 hours of field-based experiences, 30 of which show active engagement in instructional or educational activities. All time log entries must have a detailed description/reflection explaining the instructional or educational activities. At the end of the course, on the date indicated on the calendar, you must upload a screenshot of every approved time log to the appropriate Dropbox in D2L.

Online Computer Requirements

As mentioned above, it is your responsibility to have (or have access to) a working computer in this class. Assignments are due by the due date, and personal computer technical difficulties will not be considered a reason for the instructor to allow students extra time to submit assignments, tests, or discussion postings. Computers are available on campus in various areas of the buildings as well as the Academic Success Center. Your computer being down is not an excuse for missing a deadline!!

Instructor Class Policies

Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individuals to whom credit is given) will not be considered. I use Turnitin for the written assignments and D2L directly syncs with it (you do not have to do anything). You will be able to see the plagiarism percentage and are welcome to make changes and resubmit ****BEFORE**** the due date. ***Any plagiarism of 30% and above is too much! Your plagiarized assignment will not be graded, receive a zero, and no make-up allowed.**

Self-plagiarism refers to submitting work for credit that is the same or substantially similar to work prepared or submitted for another course without appropriate citation. This includes reusing previous assignments, papers, presentations, or other submissions without instructor approval. Self-plagiarism gives the impression of original work when, in fact, the content has already been submitted for assessment elsewhere. To avoid self-plagiarism, communicate openly with your instructor about building on existing work or repurposing prior submissions. Provide proper citations for any previous work referenced. Unless the instructor indicates otherwise, all assignments submitted for this course must be newly prepared by you and you alone for this specific class. **Any self-plagiarism of**

30% and above is too much! Your plagiarized assignment will not be graded, receive a zero, and no make-up allowed.

Advances in Artificial Intelligence (AI) have now provided generative and creative applications such as Chat GPT, Google Bard, Guru, Microsoft Copilot, and others. Certainly, these tools can be quite useful in the learning process; however, the content they generate does not represent the effort and learning of the student. Since writing, analytical, and critical thinking skills are part of the learning outcomes of this course, all writing assignments should be prepared by the student. Developing strong competencies in this area will prepare you for a competitive workplace. Submitting AI generated work in place of the original and genuine work of the student will be considered a form of academic misconduct. Therefore, AI-generated submissions are not permitted and will be treated as plagiarism. **Any AI generated work of 30% and above is too much! Your assignment will not be graded, receive a zero, and no make-up allowed.** You may type a question into ChatGPT, you may not exactly copy and paste its response, and turn it in as your own. If you use ChatGPT or any AI, please use it in ways that are ethical, accurate, and useful.

Any instance of plagiarism, AI-generated content, and/or self-plagiarism will be subject to disciplinary action in accordance with the Academic Integrity Policy outlined in the Student Handbook. It's important to remember that the consequences of violating this policy are serious and can have a lasting impact on your academic record. By enrolling in this course, you acknowledge and agree to comply with this plagiarism and AI-generated content policy. Your understanding and commitment to academic integrity are crucial to our learning community

Students are expected to assist in maintaining a classroom environment which is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor, students are prohibited from engaging in any form of distraction—this includes but is not limited to pagers and cell phones. In the classroom or during virtual meetings, cell phones need to be put away so that they do not disrupt the learning environment for you and others. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class and a Professional Fitness Form will be filed for review with the college. If the instructor must file a Fitness Alert Form for any reason, including failure to demonstrate appropriate teaching dispositions, the student may receive an instructor drop with an "F" for the course.

Any student who misses class (for any reason) remains responsible for contacting other students to obtain class materials. In the event that a class member is absent, for whatever reason, that individual assumes responsibility for contacting the instructor to account for missed work and to turn in work. It is impossible to provide a summary of all that takes place during any given class via email. If a student is going to be absent, they have the responsibility to contact the instructor to turn in assignments and obtain copies of any handouts from the missed class. Tentative assignment due dates are listed on the course schedule. While

the actual due dates may vary due to the flow of the class, all assignment due dates will be finalized and announced in class well in advance of the specific date. ****Late work, unless arrangements are made by the student and approved in advance by the instructor, will not be accepted for full credit.***

Instructor Drop

As per the College policies, an instructor may drop a student any time during the semester for excessive absences, for consistently failing to meet class assignments, for an indifferent attitude, or for disruptive conduct. Instructor will give the student a verbal or written warning prior to dropping the student from the class. The instructor-drop takes precedence over the student-initiated course drop of a later date. The instructor will assign a grade of either WF or F through the first 8 weeks of this semester. After this period, the grade will be an F. The date the instructor drop form is received in the Office of the Registrar is the official drop date.

Inclement Weather

In the case of campus closure due to inclement weather, updates will be shared through GroupMe and posted in the News section. The class will follow MSU's official guidance regarding closures and weather-related disruptions.

Change of Schedule

A student dropping a course (but not withdrawing from the University) within the first 12 class days of a regular semester or the first four class days of a summer semester is eligible for a 100% refund of applicable tuition and fees. Dates are published in the [Schedule of Classes](#) each semester.

Refund and Repayment Policy

A student who withdraws or is administratively withdrawn from Midwestern State University (MSU) may be eligible to receive a refund for all or a portion of the tuition, fees and room/board charges that were paid to MSU for the semester. HOWEVER, if the student received financial aid (federal/state/institutional grants, loans and/or scholarships), all or a portion of the refund may be returned to the financial aid programs. As described below, two formulas (federal and state) exists in determining the amount of the refund. (Examples of each refund calculation will be made available upon request).

College Policies

[Campus Carry Rules/Policies](#)

Refer to: [Campus Carry Rules and Policies](#)

Smoking/Tobacco Policy

College policy strictly prohibits the use of tobacco products in any building owned or operated by MSU TEXAS. Adult students may smoke only in the outside designated-smoking areas at each location.

Alcohol and Drug Policy

To comply with the Drug Free Schools and Communities Act of 1989 and subsequent amendments, students and employees of Midwestern State are informed that strictly enforced policies are in place which prohibits the unlawful possession, use or distribution of any illicit drugs, including alcohol, on university property or as part of any university-sponsored activity. Students and employees are also subject to all applicable legal sanctions under local, state and federal law for any offenses involving illicit drugs on University property or at University-sponsored activities.

Campus Carry

Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes has prohibited. The new Constitutional Carry law does not change this process. Concealed carry still requires a License to Carry permit, and openly carrying handguns is not allowed on college campuses. For more information, visit [Campus Carry](#).

Active Shooter

The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by MSU Police Department regarding the options and strategies we can all use to stay safe during difficult situations. For more information, visit [Safety / Emergency Procedures](#). Students are encouraged to watch the video entitled "Run. Hide. Fight." which may be electronically accessed via the University police department's webpage: ["Run. Hide. Fight."](#)

Obligation to Report Sex Discrimination under State and Federal Law

Midwestern State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. State and federal law require University employees to report sex discrimination and sexual misconduct to the University's Office of Title IX. As a faculty member, I am required to report to the Title IX Coordinator any allegations, personally observed behavior, or other direct or indirect knowledge of conduct that reasonably may constitute sex discrimination or sexual misconduct, which includes sexual assault, sexual harassment, dating violence, or stalking, involving a student or employee. After a report is made, the office of Title IX will reach out to the affected student or employee in an effort to connect such person(s) with resources and options in addressing the allegations.

made in the report. You are also encouraged to report any incidents to the office of Title IX. You may do so by contacting:

Laura Hetrick
Title IX Coordinator
Sunwatcher Village Clubhouse
940-397-4213

laura.hetrick@msutexas.edu

You may also file an online report 24/7 at [Online Reporting Form](#)

Should you wish to visit with someone about your experience in confidence, you may contact the MSU Counseling Center at 940-397-4618. For more information on the University's policy on Title IX or sexual misconduct, please visit [Title IX Website](#)

COVID

Scientific data shows that being fully vaccinated is the most effective way to prevent and slow the spread of COVID-19 and has the greatest probability of avoiding serious illness if infected in all age groups. Although MSU Texas is not mandating vaccinations in compliance with Governor Abbott's executive orders, we highly encourage eligible members of our community to get a vaccination. If you have questions or concerns about the vaccine, please contact your primary care physician or health care professional. Given the recent rise in cases, individuals are also strongly encouraged to wear facial coverings when indoors among groups of people, regardless of vaccination status. Although MSU Texas is not currently requiring facial coverings, they have been an effective strategy in slowing the spread.

Grade Appeal Process

Update as needed. Students who wish to appeal a grade should consult the Midwestern State University [MSU Catalog](#)

Course Schedule

Disclaimer Notice: Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor to meet the needs of the class appropriately.

***All assignments are due on Sunday – 11:59pm.** Please see attached document for a detailed course schedule.

Other Expectations

As a part of your preparation for becoming a teacher, you are expected to begin acting in a professional manner – starting today. This includes, but is not limited to:

Internship Experience – Throughout your internship experience, ask your mentor teacher to provide you with constructive feedback regarding your classroom presence, interactions with students and lessons that you present to the students. Use this information to make necessary improvements during the time that remains in the schedule. Always conduct yourself in a professional manner.

Participation – It is not enough to just “show up.” In other words, you cannot just sit there and breathe. You need to be prepared to discuss the readings that are assigned, contribute appropriately, and encourage the participation of your peers.

Preparation – Complete all assignments on time. Written assignments (whether submitted online or in class) will be discounted by 25% for each late day. Complete readings assigned prior to class in order to be able to participate in class discussions and activities.

Attitude – Demonstrate the following dispositions that are essential for learning:

- Curiosity (ask questions, look for additional answers, probe, reflect)
- Flexibility (take alternate points of view, be open-minded)
- Organization (plan ahead – literally, GET A PLANNER!)
- Patience (take time to reason, be persistent in efforts)
- Risk-taking (try things beyond your current repertoire)
- Passion (invest in ideas, processes, products, and most of all – other people)

Be aware that your attitude is conveyed to others by body language, conversation, neatness, completeness of work, willingness to assist and contribute and many other ways. A sense of humor and the ability to be flexible are crucial – not just in this class but from now on – that is the nature of the classroom.

Respect – Be considerate of others. Do not talk while others are talking; do not use foul language; behave in an ethical manner. This is particularly important considering our classroom location - we are guests in the Wichita Falls school district and should behave as such.

Professional Development – Remember that teaching requires a commitment to continual learning. You will be asked to complete several “chores” as the semester rolls along and the points earned for dispositions are affected by those “chores.” Timely completion of tasks (or “chores”) is an indication of your “fitness” to this profession.

References

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I wish you all the very best and am so happy to have you all in class!!!

Appendix A: Standards/Competencies

Teacher Preparation Standards

Mathematics Standard I - Number Concepts: The mathematics teacher understands and uses numbers, number systems and their structure, operations and algorithms, quantitative reasoning and technology appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in order to prepare students to use mathematics.

Mathematics Standard II Patterns and Algebra: The mathematics teacher understands and uses patterns, relations, functions, algebraic reasoning, analysis and technology appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in order to prepare students to use mathematics.

Mathematics Standard III Geometry and Measurement: The mathematics teacher understands and uses geometry, spatial reasoning, measurement concepts and principles and technology appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in order to prepare students to use mathematics.

Mathematics Standard IV Probability and Statistics: The mathematics teacher understands and uses probability and statistics, their applications and technology appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in order to prepare students to use mathematics.

Mathematics Standard V Mathematical Processes: The mathematics teacher understands and uses mathematical processes to reason mathematically, to solve mathematical problems, to make mathematical connections within and outside of mathematics and to communicate mathematically.

Mathematics Standard VI Mathematical Perspectives: The mathematics teacher understands the historical development of mathematical ideas, the interrelationship between society and mathematics, the structure of mathematics and the evolving nature of mathematics and mathematical knowledge.

Mathematics Standard VII Mathematical Learning and Instruction: The mathematics teacher understands how children learn and develop mathematical skills, procedures and concepts; knows typical errors students make; and uses this knowledge to plan, organize and implement instruction; to meet curriculum goals; and to teach all students to understand and use mathematics.

Mathematics Standard VIII Mathematical Assessment: The mathematics teacher understands assessment and uses a variety of formal and informal assessment techniques appropriate to the learner on an ongoing basis to monitor and guide instruction and to evaluate and report student progress.

Mathematics Standard IX Professional Development: The mathematics teacher understands mathematics teaching as a profession, knows the value and rewards of being a reflective practitioner and realizes the importance of making a lifelong commitment to professional growth and development.

TEKS Standards

Pre-K

Child identifies objects. V.A.1. Child knows that objects, or parts of an object, can be counted.

Child recites number words in order up to 10. V.A.2. Child uses words to rote count from 1 to 30.

Child counts up to 4 objects with one count per item. V.A.3. Child counts 1– 10 items, with one count per item.

Child identifies items that can be counted. V.A.4. Child demonstrates that the order of the counting sequence is always the same, regardless of what is counted.

Child counts up to 4 items and demonstrates understanding that the last count indicates how many items were counted. V.A.5. Child counts up to 10 items and demonstrates that the last count indicates how many items were counted.

Child begins to understand that items can be counted. V.A.6. Child demonstrates understanding that when counting, the items can be chosen in any order

Child demonstrates proper use of the word "first." V.A.7. Child uses the verbal ordinal terms.

Child verbally identifies without counting the number of objects from 1 to 3. V.A.8.

Child verbally identifies, without counting, the number of objects from 1 to 5.

Child recognizes one-digit numerals 1–4. V.A.9. Child recognizes one-digit numerals, 0–9.

Child understands that adding one or more concrete objects to a set will increase the number of objects in the set. V.B.1. Child uses concrete objects, creates pictorial models and shares a verbal word problem for adding up to 5 objects.

Child understands that taking away one or more objects from a set will decrease the number of objects in the set. V.B.2. Child uses concrete models or makes a verbal word problem for subtracting 0–5 objects from a set.

Child identifies two groups of objects placed side-by-side as being equal or non-equal. V.B.3. Child uses informal strategies to separate up to 10 items into equal groups.

Child recognizes common shapes. V.C.1. Child names common shapes.

Child manipulates shapes using fine and gross motor skills. V.C.2. Child creates shapes.

Child begins to use language to describe location of objects. V.C.3. Child demonstrates use of location words (such as "over," "under," "above," "on," "beside," "next to," "between," "in front of," "near," "far," etc.).

Child moves objects during informal play. V.C.4. Child slides, flips, and turns shapes to demonstrate that the shapes remain the same.

Child understands that lengths of objects can vary and be compared. V.D.1. Child recognizes and compares heights or lengths of people or objects.

Child begins to recognize how much can be placed within an object. V.D.2. Child recognizes how much can be placed within an object.

Child understands that weights of objects can vary and be compared. V.D.3. Child informally recognizes and compares weights of objects or people.

Child shows awareness of the passage of time. V.D.4. Child uses language to describe concepts associated with the passing of time.

Child sorts objects that are the same and different. V.E.1. Child sorts objects that are the same and different into groups and uses language to describe how the groups are similar and different.

Child recognizes that data can be organized into a graphic representation. V.E.2. Child collects data and organizes it in a graphic representation.

Child begins to recognize patterns. V.E.3. Child recognizes and creates patterns.

Kindergarten

(1) Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

(A) apply mathematics to problems arising in everyday life, society, and the workplace;

(B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;

(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;

(D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;

(E) create and use representations to organize, record, and communicate mathematical ideas;

(F) analyze mathematical relationships to connect and communicate mathematical ideas; and

(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

(2) Number and operations. The student applies mathematical process standards to understand how to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system.

The student is expected to:

(A) count forward and backward to at least 20 with and without objects;

(B) read, write, and represent whole numbers from 0 to at least 20 with and without objects or pictures;

(C) count a set of objects up to at least 20 and demonstrate that the last number said tells the number of objects in the set regardless of their arrangement or order;

(D) recognize instantly the quantity of a small group of objects in organized and random arrangements;

(E) generate a set using concrete and pictorial models that represents a number that is more than, less than, and equal to a given number up to 20;

(F) generate a number that is one more than or one less than another number up to at least 20;

(G) compare sets of objects up to at least 20 in each set using comparative language;

(H) use comparative language to describe two numbers up to 20 presented as written numerals; and

(I) compose and decompose numbers up to 10 with objects and pictures.

(3) Number and operations. The student applies mathematical process standards to develop an understanding of addition and subtraction situations in order to solve problems. The student is expected to:

- (A) model the action of joining to represent addition and the action of separating to represent subtraction;
- (B) solve word problems using objects and drawings to find sums up to 10 and differences within 10; and
- (C) explain the strategies used to solve problems involving adding and subtracting within 10 using spoken words, concrete and pictorial models, and number sentences.
- (4) Number and operations. The student applies mathematical process standards to identify coins in order to recognize the need for monetary transactions. The student is expected to identify U.S. coins by name, including pennies, nickels, dimes, and quarters.
- (5) Algebraic reasoning. The student applies mathematical process standards to identify the pattern in the number word list. The student is expected to recite numbers up to at least 100 by ones and tens beginning with any given number.
- (6) Geometry and measurement. The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to:
- (A) identify two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles;
 - (B) identify three-dimensional solids, including cylinders, cones, spheres, and cubes, in the real world;
 - (C) identify two-dimensional components of three-dimensional objects;
 - (D) identify attributes of two-dimensional shapes using informal and formal geometric language interchangeably;
 - (E) classify and sort a variety of regular and irregular two- and three-dimensional figures regardless of orientation or size; and
 - (F) create two-dimensional shapes using a variety of materials and drawings.
- (7) Geometry and measurement. The student applies mathematical process standards to directly compare measurable attributes. The student is expected to:
- (A) give an example of a measurable attribute of a given object, including length, capacity, and weight; and
 - (B) compare two objects with a common measurable attribute to see which object has more of/less of the attribute and describe the difference.
- (8) Data analysis. The student applies mathematical process standards to collect and organize data to make it useful for interpreting information. The student is expected to:
- (A) collect, sort, and organize data into two or three categories;
 - (B) use data to create real-object and picture graphs; and
 - (C) draw conclusions from real-object and picture graphs.
- (9) Personal financial literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:
- (A) identify ways to earn income;
 - (B) differentiate between money received as income and money received as gifts;
 - (C) list simple skills required for jobs; and

(D) distinguish between wants and needs and identify income as a source to meet one's wants and needs

First Grade

(1) Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

(A) apply mathematics to problems arising in everyday life, society, and the workplace;

(B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;

(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;

(D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;

(E) create and use representations to organize, record, and communicate mathematical ideas;

(F) analyze mathematical relationships to connect and communicate mathematical ideas; and

(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

(2) Number and operations. The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:

(A) recognize instantly the quantity of structured arrangements;

(B) use concrete and pictorial models to compose and decompose numbers up to 120 in more than one way as so many hundreds, so many tens, and so many ones; (C) use objects, pictures, and expanded and standard forms to represent numbers up to 120;

(D) generate a number that is greater than or less than a given whole number up to 120;

(E) use place value to compare whole numbers up to 120 using comparative language;

(F) order whole numbers up to 120 using place value and open number lines; and

(G) represent the comparison of two numbers to 100 using the symbols $>$, $<$, or $=$.

(3) Number and operations. The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction computations in order to solve problems. The student is expected to:

(A) use concrete and pictorial models to determine the sum of a multiple of 10 and a one-digit number in problems up to 99;

(B) use objects and pictorial models to solve word problems involving joining, separating, and comparing sets within 20 and unknowns as any one of the terms in the problem such as $2 + 4 = []$; $3 + [] = 7$; and $5 = [] - 3$;

- (C) compose 10 with two or more addends with and without concrete objects;
 - (D) apply basic fact strategies to add and subtract within 20, including making 10 and decomposing a number leading to a 10;
 - (E) explain strategies used to solve addition and subtraction problems up to 20 using spoken words, objects, pictorial models, and number sentences; and
 - (F) generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20.
- (4) Number and operations. The student applies mathematical process standards to identify coins, their values, and the relationships among them in order to recognize the need for monetary transactions. The student is expected to:
- (A) identify U.S. coins, including pennies, nickels, dimes, and quarters, by value and describe the relationships among them;
 - (B) write a number with the cent symbol to describe the value of a coin; and
 - (C) use relationships to count by twos, fives, and tens to determine the value of a collection of pennies, nickels, and/or dimes.
- (5) Algebraic reasoning. The student applies mathematical process standards to identify and apply number patterns within properties of numbers and operations in order to describe relationships. The student is expected to:
- (A) recite numbers forward and backward from any given number between 1 and 120;
 - (B) skip count by twos, fives, and tens to determine the total number of objects up to 120 in a set;
 - (C) use relationships to determine the number that is 10 more and 10 less than a given number up to 120;
 - (D) represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences;
 - (E) understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value(s);
 - (F) determine the unknown whole number in an addition or subtraction equation when the unknown may be any one of the three or four terms in the equation; and
 - (G) apply properties of operations to add and subtract two or three numbers.
- (6) Geometry and measurement. The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to:
- (A) classify and sort regular and irregular two-dimensional shapes based on attributes using informal geometric language;
 - (B) distinguish between attributes that define a two-dimensional or three-dimensional figure and attributes that do not define the shape;
 - (C) create two-dimensional figures, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons;
 - (D) identify two-dimensional shapes, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons and describe their attributes using formal geometric language;
 - (E) identify three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes), and triangular prisms, and describe their attributes using formal geometric language;

- (F) compose two-dimensional shapes by joining two, three, or four figures to produce a target shape in more than one way if possible;
 - (G) partition two-dimensional figures into two and four fair shares or equal parts and describe the parts using words; and
 - (H) identify examples and non-examples of halves and fourths.
- (7) Geometry and measurement. The student applies mathematical process standards to select and use units to describe length and time. The student is expected to:
- (A) use measuring tools to measure the length of objects to reinforce the continuous nature of linear measurement;
 - (B) illustrate that the length of an object is the number of same-size units of length that, when laid end-to-end with no gaps or overlaps, reach from one end of the object to the other;
 - (C) measure the same object/distance with units of two different lengths and describe how and why the measurements differ;
 - (D) describe a length to the nearest whole unit using a number and a unit; and
 - (E) tell time to the hour and half hour using analog and digital clocks.
- (8) Data analysis. The student applies mathematical process standards to organize data to make it useful for interpreting information and solving problems. The student is expected to:
- (A) collect, sort, and organize data in up to three categories using models/representations such as tally marks or T-charts;
 - (B) use data to create picture and bar-type graphs; and
 - (C) draw conclusions and generate and answer questions using information from picture and bar-type graphs.
- (9) Personal financial literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:
- (A) define money earned as income;
 - (B) identify income as a means of obtaining goods and services, oftentimes making choices between wants and needs;
 - (C) distinguish between spending and saving; and
 - (D) consider charitable giving.

Second Grade

- (1) Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
- (A) apply mathematics to problems arising in everyday life, society, and the workplace;
 - (B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;
 - (C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;

(D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;

(E) create and use representations to organize, record, and communicate mathematical ideas;

(F) analyze mathematical relationships to connect and communicate mathematical ideas; and

(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

(2) Number and operations. The student applies mathematical process standards to understand how to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:

(A) use concrete and pictorial models to compose and decompose numbers up to 1,200 in more than one way as a sum of so many thousands, hundreds, tens, and ones;

(B) use standard, word, and expanded forms to represent numbers up to 1,200;

(C) generate a number that is greater than or less than a given whole number up to 1,200;

(D) use place value to compare and order whole numbers up to 1,200 using comparative language, numbers, and symbols ($>$, $<$, or $=$);(E) locate the position of a given whole number on an open number line; and

(F) name the whole number that corresponds to a specific point on a number line.

(3) Number and operations. The student applies mathematical process standards to recognize and represent fractional units and communicates how they are used to name parts of a whole. The student is expected to:

(A) partition objects into equal parts and name the parts, including halves, fourths, and eighths, using words;(B) explain that the more fractional parts used to make a whole, the smaller the part; and the fewer the fractional parts, the larger the part;

(C) use concrete models to count fractional parts beyond one whole using words and recognize how many parts it takes to equal one whole; and

(D) identify examples and non-examples of halves, fourths, and eighths.

(4) Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations in order to solve addition and subtraction problems with efficiency and accuracy. The student is expected to:

(A) recall basic facts to add and subtract within 20 with automaticity;

(B) add up to four two-digit numbers and subtract two-digit numbers using mental strategies and algorithms based on knowledge of place value and properties of operations;

(C) solve one-step and multi-step word problems involving addition and subtraction within 1,000 using a variety of strategies based on place value, including algorithms; and

(D) generate and solve problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000.

(5) Number and operations. The student applies mathematical process standards to determine the value of coins in order to solve monetary transactions. The student is expected to:

(A) determine the value of a collection of coins up to one dollar; and

(B) use the cent symbol, dollar sign, and the decimal point to name the value of a collection of coins.

(6) Number and operations. The student applies mathematical process standards to connect repeated addition and subtraction to multiplication and division situations that involve equal groupings and shares. The student is expected to:

(A) model, create, and describe contextual multiplication situations in which equivalent sets of concrete objects are joined; and

(B) model, create, and describe contextual division situations in which a set of concrete objects is separated into equivalent sets.

(7) Algebraic reasoning. The student applies mathematical process standards to identify and apply number patterns within properties of numbers and operations in order to describe relationships. The student is expected to:

(A) determine whether a number up to 40 is even or odd using pairings of objects to represent the number;

(B) use an understanding of place value to determine the number that is 10 or 100 more or less than a given number up to 1,200; and

(C) represent and solve addition and subtraction word problems where unknowns may be any one of the terms in the problem.

(8) Geometry and measurement. The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to:

(A) create two-dimensional shapes based on given attributes, including number of sides and vertices;

(B) classify and sort three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes as special rectangular prisms), and triangular prisms, based on attributes using formal geometric language;

(C) classify and sort polygons with 12 or fewer sides according to attributes, including identifying the number of sides and number of vertices;

(D) compose two-dimensional shapes and three-dimensional solids with given properties or attributes; and

(E) decompose two-dimensional shapes such as cutting out a square from a rectangle, dividing a shape in half, or partitioning a rectangle into identical triangles and identify the resulting geometric parts.

(9) Geometry and measurement. The student applies mathematical process standards to select and use units to describe length, area, and time. The student is expected to:

(A) find the length of objects using concrete models for standard units of length;

(B) describe the inverse relationship between the size of the unit and the number of units needed to equal the length of an object;

(C) represent whole numbers as distances from any given location on a number line;

- (D) determine the length of an object to the nearest marked unit using rulers, yardsticks, meter sticks, or measuring tapes;
 - (E) determine a solution to a problem involving length, including estimating lengths;
 - (F) use concrete models of square units to find the area of a rectangle by covering it with no gaps or overlaps, counting to find the total number of square units, and describing the measurement using a number and the unit; and
 - (G) read and write time to the nearest one-minute increment using analog and digital clocks and distinguish between a.m. and p.m.
- (10) Data analysis. The student applies mathematical process standards to organize data to make it useful for interpreting information and solving problems. The student is expected to:
- (A) explain that the length of a bar in a bar graph or the number of pictures in a pictograph represents the number of data points for a given category;
 - (B) organize a collection of data with up to four categories using pictographs and bar graphs with intervals of one or more;
 - (C) write and solve one-step word problems involving addition or subtraction using data represented within pictographs and bar graphs with intervals of one; and
 - (D) draw conclusions and make predictions from information in a graph.
- (11) Personal financial literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:
- (A) calculate how money saved can accumulate into a larger amount over time;
 - (B) explain that saving is an alternative to spending;
 - (C) distinguish between a deposit and a withdrawal;
 - (D) identify examples of borrowing and distinguish between responsible and irresponsible borrowing;
 - (E) identify examples of lending and use concepts of benefits and costs to evaluate lending decisions; and
 - (F) differentiate between producers and consumers and calculate the cost to produce a simple item

Fourth Grade

- (1) Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
- (A) apply mathematics to problems arising in everyday life, society, and the workplace;
 - (B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;
 - (C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;
 - (D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;

- (E) create and use representations to organize, record, and communicate mathematical ideas;
 - (F) analyze mathematical relationships to connect and communicate mathematical ideas; and
 - (G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.
- (2) Number and operations. The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value. The student is expected to:
- (A) interpret the value of each place-value position as 10 times the position to the right and as one-tenth of the value of the place to its left;
 - (B) represent the value of the digit in whole numbers through 1,000,000,000 and decimals to the hundredths using expanded notation and numerals;
 - (C) compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols $>$, $<$, or $=$;
 - (D) round whole numbers to a given place value through the hundred thousands place;
 - (E) represent decimals, including tenths and hundredths, using concrete and visual models and money;
 - (F) compare and order decimals using concrete and visual models to the hundredths;
 - (G) relate decimals to fractions that name tenths and hundredths; and
 - (H) determine the corresponding decimal to the tenths or hundredths place of a specified point on a number line.
- (3) Number and operations. The student applies mathematical process standards to represent and generate fractions to solve problems. The student is expected to:
- (A) represent a fraction a/b as a sum of fractions $1/b$, where a and b are whole numbers and $b > 0$, including when $a > b$;
 - (B) decompose a fraction in more than one way into a sum of fractions with the same denominator using concrete and pictorial models and recording results with symbolic representations;
 - (C) determine if two given fractions are equivalent using a variety of methods;
 - (D) compare two fractions with different numerators and different denominators and represent the comparison using the symbols $>$, $=$, or $<$;
 - (E) represent and solve addition and subtraction of fractions with equal denominators using objects and pictorial models that build to the number line and properties of operations;
 - (F) evaluate the reasonableness of sums and differences of fractions using benchmark fractions 0, $1/4$, $1/2$, $3/4$, and 1, referring to the same whole; and
 - (G) represent fractions and decimals to the tenths or hundredths as distances from zero on a number line.
- (4) Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to:
- (A) add and subtract whole numbers and decimals to the hundredths place using the standard algorithm;

- (B) determine products of a number and 10 or 100 using properties of operations and place value understandings;
 - (C) represent the product of 2 two-digit numbers using arrays, area models, or equations, including perfect squares through 15 by 15;
 - (D) use strategies and algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number and to multiply a two-digit number by a two-digit number. Strategies may include mental math, partial products, and the commutative, associative, and distributive properties;
 - (E) represent the quotient of up to a four-digit whole number divided by a one-digit whole number using arrays, area models, or equations;
 - (F) use strategies and algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor;
 - (G) round to the nearest 10, 100, or 1,000 or use compatible numbers to estimate solutions involving whole numbers; and
 - (H) solve with fluency one- and two-step problems involving multiplication and division, including interpreting remainders.
- (5) Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:
- (A) represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity;
 - (B) represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence;
 - (C) use models to determine the formulas for the perimeter of a rectangle ($l + w + l + w$ or $2l + 2w$), including the special form for perimeter of a square ($4s$) and the area of a rectangle ($l \times w$); and
 - (D) solve problems related to perimeter and area of rectangles where dimensions are whole numbers.
- (6) Geometry and measurement. The student applies mathematical process standards to analyze geometric attributes in order to develop generalizations about their properties. The student is expected to:
- (A) identify points, lines, line segments, rays, angles, and perpendicular and parallel lines;
 - (B) identify and draw one or more lines of symmetry, if they exist, for a two-dimensional figure;
 - (C) apply knowledge of right angles to identify acute, right, and obtuse triangles; and
 - (D) classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size.
- (7) Geometry and measurement. The student applies mathematical process standards to solve problems involving angles less than or equal to 180 degrees. The student is expected to:
- (A) illustrate the measure of an angle as the part of a circle whose center is at the vertex of the angle that is "cut out" by the rays of the angle. Angle measures are limited to whole numbers;

(B) illustrate degrees as the units used to measure an angle, where $1/360$ of any circle is one degree and an angle that "cuts" $n/360$ out of any circle whose center is at the angle's vertex has a measure of n degrees. Angle measures are limited to whole numbers;

(C) determine the approximate measures of angles in degrees to the nearest whole number using a protractor;

(D) draw an angle with a given measure; and

(E) determine the measure of an unknown angle formed by two non-overlapping adjacent angles given one or both angle measures.

(8) Geometry and measurement. The student applies mathematical process standards to select appropriate customary and metric units, strategies, and tools to solve problems involving measurement. The student is expected to:

(A) identify relative sizes of measurement units within the customary and metric systems;

(B) convert measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table; and

(C) solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate.

(9) Data analysis. The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data. The student is expected to:

(A) represent data on a frequency table, dot plot, or stem-and-leaf plot marked with whole numbers and fractions; and

(B) solve one- and two-step problems using data in whole number, decimal, and fraction form in a frequency table, dot plot, or stem-and-leaf plot.

(10) Personal financial literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:

(A) distinguish between fixed and variable expenses;

(B) calculate profit in a given situation;

(C) compare the advantages and disadvantages of various savings options;

(D) describe how to allocate a weekly allowance among spending; saving, including for college; and sharing; and

(E) describe the basic purpose of financial institutions, including keeping money safe, borrowing money, and lending.

Fifth Grade

(1) Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

(A) apply mathematics to problems arising in everyday life, society, and the workplace;

(B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;

- (C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;
- (D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
- (E) create and use representations to organize, record, and communicate mathematical ideas;
- (F) analyze mathematical relationships to connect and communicate mathematical ideas; and
- (G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

(2) Number and operations. The student applies mathematical process standards to represent, compare, and order positive rational numbers and understand relationships as related to place value. The student is expected to:

- (A) represent the value of the digit in decimals through the thousandths using expanded notation and numerals;
- (B) compare and order two decimals to thousandths and represent comparisons using the symbols $>$, $<$, or $=$; and
- (C) round decimals to tenths or hundredths.

(3) Number and operations. The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy. The student is expected to:

- (A) estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, multiplication, or division;
- (B) multiply with fluency a three-digit number by a two-digit number using the standard algorithm;
- (C) solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm;
- (D) represent multiplication of decimals with products to the hundredths using objects and pictorial models, including area models;
- (E) solve for products of decimals to the hundredths, including situations involving money, using strategies based on place-value understandings, properties of operations, and the relationship to the multiplication of whole numbers;
- (F) represent quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using objects and pictorial models, including area models;
- (G) solve for quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using strategies and algorithms, including the standard algorithm;
- (H) represent and solve addition and subtraction of fractions with unequal denominators referring to the same whole using objects and pictorial models and properties of operations;
- (I) represent and solve multiplication of a whole number and a fraction that refers to the same whole using objects and pictorial models, including area models;

- (J) represent division of a unit fraction by a whole number and the division of a whole number by a unit fraction such as $\frac{1}{3} \div 7$ and $7 \div \frac{1}{3}$ using objects and pictorial models, including area models;
 - (K) add and subtract positive rational numbers fluently; and
 - (L) divide whole numbers by unit fractions and unit fractions by whole numbers.
- (4) Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:
- (A) identify prime and composite numbers;
 - (B) represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity;
 - (C) generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph;
 - (D) recognize the difference between additive and multiplicative numerical patterns given in a table or graph;
 - (E) describe the meaning of parentheses and brackets in a numeric expression;
 - (F) simplify numerical expressions that do not involve exponents, including up to two levels of grouping;
 - (G) use concrete objects and pictorial models to develop the formulas for the volume of a rectangular prism, including the special form for a cube ($V = l \times w \times h$, $V = s \times s \times s$, and $V = Bh$); and
 - (H) represent and solve problems related to perimeter and/or area and related to volume
- (5) Geometry and measurement. The student applies mathematical process standards to classify two-dimensional figures by attributes and properties. The student is expected to classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties.
- (6) Geometry and measurement. The student applies mathematical process standards to understand, recognize, and quantify volume. The student is expected to:
- (A) recognize a cube with side length of one unit as a unit cube having one cubic unit of volume and the volume of a three-dimensional figure as the number of unit cubes (n cubic units) needed to fill it with no gaps or overlaps if possible; and
 - (B) determine the volume of a rectangular prism with whole number side lengths in problems related to the number of layers times the number of unit cubes in the area of the base.
- (7) Geometry and measurement. The student applies mathematical process standards to select appropriate units, strategies, and tools to solve problems involving measurement. The student is expected to solve problems by calculating conversions within a measurement system, customary or metric.
- (8) Geometry and measurement. The student applies mathematical process standards to identify locations on a coordinate plane. The student is expected to:
- (A) describe the key attributes of the coordinate plane, including perpendicular number lines (axes) where the intersection (origin) of the two lines coincides with zero on each number line and the given point (0, 0); the x - coordinate, the first number in an ordered pair, indicates movement parallel to the x - axis starting at the origin; and the y - coordinate, the second number, indicates movement parallel to the y - axis starting at the origin;

- (B) describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane; and
- (C) graph in the first quadrant of the coordinate plane ordered pairs of numbers arising from mathematical and real-world problems, including those generated by number patterns or found in an input-output table.
- (9) Data analysis. The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data. The student is expected to:
 - (A) represent categorical data with bar graphs or frequency tables and numerical data, including data sets of measurements in fractions or decimals, with dot plots or stem-and-leaf plots;
 - (B) represent discrete paired data on a scatterplot; and
 - (C) solve one- and two-step problems using data from a frequency table, dot plot, bar graph, stem-and-leaf plot, or scatterplot.
- (10) Personal financial literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:
 - (A) define income tax, payroll tax, sales tax, and property tax;
 - (B) explain the difference between gross income and net income;
 - (C) identify the advantages and disadvantages of different methods of payment, including check, credit card, debit card, and electronic payments;
 - (D) develop a system for keeping and using financial records;
 - (E) describe actions that might be taken to balance a budget when expenses exceed income; and
 - (F) balance a simple budget.

Sixth Grade

- (1) Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
 - (A) apply mathematics to problems arising in everyday life, society, and the workplace;
 - (B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;
 - (C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;
 - (D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
 - (E) create and use representations to organize, record, and communicate mathematical ideas;
 - (F) analyze mathematical relationships to connect and communicate mathematical ideas; and
 - (G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

(2) Number and operations. The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to:

(A) classify whole numbers, integers, and rational numbers using a visual representation such as a Venn diagram to describe relationships between sets of numbers;

(B) identify a number, its opposite, and its absolute value;

(C) locate, compare, and order integers and rational numbers using a number line;

(D) order a set of rational numbers arising from mathematical and real-world contexts; and

(E) extend representations for division to include fraction notation such as a/b represents the same number as $a \div b$ where $b \neq 0$.

(3) Number and operations. The student applies mathematical process standards to represent addition, subtraction, multiplication, and division while solving problems and justifying solutions. The student is expected to:

(A) recognize that dividing by a rational number and multiplying by its reciprocal result in equivalent values;

(B) determine, with and without computation, whether a quantity is increased or decreased when multiplied by a fraction, including values greater than or less than one;

(C) represent integer operations with concrete models and connect the actions with the models to standardized algorithms;

(D) add, subtract, multiply, and divide integers fluently; and

(E) multiply and divide positive rational numbers fluently.

(4) Proportionality. The student applies mathematical process standards to develop an understanding of proportional relationships in problem situations. The student is expected to:

(A) compare two rules verbally, numerically, graphically, and symbolically in the form of $y = ax$ or $y = x + a$ in order to differentiate between additive and multiplicative relationships;

(B) apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates;

(C) give examples of ratios as multiplicative comparisons of two quantities describing the same attribute;

(D) give examples of rates as the comparison by division of two quantities having different attributes, including rates as quotients;

(E) represent ratios and percents with concrete models, fractions, and decimals;

(F) represent benchmark fractions and percents such as 1%, 10%, 25%, $33\frac{1}{3}\%$, and multiples of these values using 10 by 10 grids, strip diagrams, number lines, and numbers;

(G) generate equivalent forms of fractions, decimals, and percents using real-world problems, including problems that involve money; and

(H) convert units within a measurement system, including the use of proportions and unit rates.

(5) Proportionality. The student applies mathematical process standards to solve problems involving proportional relationships. The student is expected to:

(A) represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions;
(B) solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models; and
(C) use equivalent fractions, decimals, and percents to show equal parts of the same whole.

(6) Expressions, equations, and relationships. The student applies mathematical process standards to use multiple representations to describe algebraic relationships. The student is expected to:

(A) identify independent and dependent quantities from tables and graphs;
(B) write an equation that represents the relationship between independent and dependent quantities from a table; and
(C) represent a given situation using verbal descriptions, tables, graphs, and equations in the form $y = kx$ or $y = x + b$.

(7) Expressions, equations, and relationships. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:

(A) generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization;
(B) distinguish between expressions and equations verbally, numerically, and algebraically;
(C) determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations; and
(D) generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties.

(8) Expressions, equations, and relationships. The student applies mathematical process standards to use geometry to represent relationships and solve problems. The student is expected to:

(A) extend previous knowledge of triangles and their properties to include the sum of angles of a triangle, the relationship between the lengths of sides and measures of angles in a triangle, and determining when three lengths form a triangle;
(B) model area formulas for parallelograms, trapezoids, and triangles by decomposing and rearranging parts of these shapes;
(C) write equations that represent problems related to the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers; and
(D) determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers.

(9) Expressions, equations, and relationships. The student applies mathematical process standards to use equations and inequalities to represent situations. The student is expected to:

(A) write one-variable, one-step equations and inequalities to represent constraints or conditions within problems;
(B) represent solutions for one-variable, one-step equations and inequalities on number lines; and

(C) write corresponding real-world problems given one-variable, one-step equations or inequalities.

(10) Expressions, equations, and relationships. The student applies mathematical process standards to use equations and inequalities to solve problems. The student is expected to:

(A) model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts; and

(B) determine if the given value(s) make(s) one-variable, one-step equations or inequalities true.

(11) Measurement and data. The student applies mathematical process standards to use coordinate geometry to identify locations on a plane. The student is expected to graph points in all four quadrants using ordered pairs of rational numbers.

(12) Measurement and data. The student applies mathematical process standards to use numerical or graphical representations to analyze problems. The student is expected to:

(A) represent numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots;

(B) use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution;

(C) summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution; and

(D) summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution.

(13) Measurement and data. The student applies mathematical process standards to use numerical or graphical representations to solve problems. The student is expected to:

(A) interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots; and

(B) distinguish between situations that yield data with and without variability.

(14) Personal financial literacy. The student applies mathematical process standards to develop an economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor. The student is expected to:

(A) compare the features and costs of a checking account and a debit card offered by different local financial institutions;

(B) distinguish between debit cards and credit cards;

(C) balance a check register that includes deposits, withdrawals, and transfers;

(D) explain why it is important to establish a positive credit history;

(E) describe the information in a credit report and how long it is retained;

(F) describe the value of credit reports to borrowers and to lenders;

(G) explain various methods to pay for college, including through savings, grants, scholarships, student loans, and work-study; and

(H) compare the annual salary of several occupations requiring various levels of post-secondary education or vocational training and calculate the effects of the different annual salaries on lifetime income.

Appendix B: Required assignment/standard alignment matrix

Assignment	Course Objectives - (CO #)	WCOE Standard (WCOE #) EC-6 Competency (EC6C #)
Technology Assignment	CO #10	WCOE #4
Introspection/Reflection Assignment	CO #1	WCOE #9 Applicable Teks/Tech Standards
Vertical Alignment Assignment	CO #1	WCOE #1,4,5, EC6C #1,2,3,4,5,6 Applicable Teks/Tech Standards
Mini Teaching	CO #2,4,5,7,8,10	WCOE #1,2,4,5,7,8, EC6C #1,2,6 Applicable Teks/Tech Standards
Classroom Observation	CO #2,6,7,8,9	WCOE #1,2,3,4,5,6,7,8,10 EC6C #1,2,3,4,5,6 TT #1-6, PPR-All
Instructional Strategy Presentation	CO #6, 10	WCOE #8, EC6C #1,3,4,6
Reflection Assignment	CO #1,9	WCOE #1,2,3,7,8,9,10 EC6C #1,6
Unit Plan	CO #1,2,3	WCOE #1,2,3,4,5,7,8,10 EC6C #1,2,3,4,5,6
Field Experience	CO #1,2,3,4,6,9,10	WCOE #1,2,3,4,5,6,7,8,9,10 EC6C #1,2,3,4,5,6 Applicable Teks/Tech Standards
In Class Activities: class discussion, lecture, guided reading, guest speakers, case study, peer practice, experiential learning, exploration, and role playing	CO #1,2,3,4,5,6,7,8,9,10	WCOE #1,2,3,4,5,6,7,8,9,10 EC6C #1,2,3,4,5,6 Applicable Teks/Tech Standards TT #1-6, PPR-All