

Understanding by Design
Unit planning template
Identify Goals & Understandings > Assessment > Activities

Stage 1
Desired Results
School Driven

Established Goals/Transfer Goal: Learners will recognize and apply basic addition and subtraction facts and principles. They will evaluate and utilize these foundational math concepts effectively in different scenarios.

Enduring Understandings:

Students will understand that...

- Basic addition and subtraction are fundamental operations in mathematics, forming the basis for more complex mathematical concepts.
- Mastering basic addition and subtraction facts is crucial for building a strong foundation in mathematics, enabling them to solve more advanced problems with confidence.
- Addition and subtraction principles extend beyond numerical calculations, playing a vital role in problem-solving across various real-world scenarios.
- The application of basic addition and subtraction facts is not limited to isolated math problems; rather, these skills are essential for everyday situations, such as budgeting, time management, and other practical activities.
- A deep comprehension of basic addition and subtraction is a gateway to mathematical fluency, allowing them to approach mathematical challenges with flexibility and creativity.
- The mastery of basic addition and subtraction is a gradual process, and consistent practice is key to internalizing these concepts for long-term retention and application.

Essential Questions:

- What are the foundational principles underlying basic addition and subtraction, and how can they be applied to solve a variety of mathematical problems?
- How can learners use basic addition and subtraction facts to analyze and solve real-world scenarios, emphasizing the practical applications of these mathematical concepts?
- In what ways do basic addition and subtraction skills contribute to developing a deeper understanding of more advanced mathematical concepts, aligning with the overarching goal of the unit?
- How can students evaluate the effectiveness of their application of basic addition and subtraction facts in different problem-solving situations?
- What connections can students identify between basic addition and subtraction principles and their relevance in everyday tasks, such as time management, budgeting, and other practical scenarios?
- How does the mastery of basic addition and subtraction contribute to mathematical fluency, and how can students monitor their progress toward achieving this goal throughout the unit?
- In what ways can learners collaboratively explore and discuss various problem-solving strategies related to basic addition and subtraction, promoting a shared understanding and appreciation for diverse approaches?

Students will know...

- The fundamental principles of basic addition and subtraction, developing a solid conceptual understanding of these operations as the cornerstone of mathematical problem-solving.
- How to recognize and memorize basic addition and subtraction facts, laying the groundwork for mathematical fluency and proficiency in more complex mathematical tasks.
- How to apply basic addition and subtraction principles in various real-world scenarios, showcasing their ability to transfer these foundational skills to practical situations.
- The importance of evaluating the relevance of basic addition and subtraction in different contexts, fostering a critical mindset that goes beyond rote memorization to thoughtful application.
- How to utilize basic addition and subtraction skills as tools for efficient problem-solving, empowering them to tackle a diverse range of mathematical challenges with confidence.
- The connections between basic addition and subtraction and their applications in everyday life, recognizing the practical significance of these foundational math concepts in various aspects of daily activities.
- The value of self-assessment and reflection in monitoring their progress toward mathematical fluency in basic addition and subtraction, promoting a sense of ownership and responsibility for their learning.

Students will be able to...

- Demonstrate proficiency in mental math, applying strategies like counting on, making tens, and decomposing numbers to solve addition and subtraction problems efficiently.
- Articulate the inverse relationship between addition and subtraction, explaining how these operations can be used to check the accuracy of each other's results.
- Solve word problems involving basic addition and subtraction, showcasing their ability to translate real-world situations into mathematical expressions and perform the necessary calculations.
- Master regrouping techniques, confidently using borrowing and carrying over when adding and subtracting two- and three-digit numbers.
- Create and solve their own addition and subtraction problems, demonstrating a creative application of foundational concepts and reinforcing their understanding of mathematical principles.
- Effectively communicate their mathematical reasoning, using appropriate language and representations to express solutions and strategies for addition and subtraction problems.
- Identify patterns and relationships within basic addition and subtraction facts, applying this knowledge to generalize their understanding and make connections to broader mathematical concepts.
- Self-assess their progress in basic addition and subtraction, setting personal goals for improvement and utilizing feedback to enhance their mathematical skills.
- Collaborate with classmates in problem-solving activities, demonstrating effective communication, teamwork, and the ability to consider multiple perspectives when applying basic addition and subtraction concepts in diverse scenarios.

Stage 2

Assessment Evidence:

Teacher and School Driven

How will we know if students have learned?

Formative Assessments:

- Students will be quizzed on basic addition and subtraction facts and principles.

Summative

Summary in GRASPS form

Goal(s): Students will demonstrate their understanding and application of basic addition and subtraction facts and principles through a quiz.

Role: Students will take on the role of math problem solvers and demonstrate their knowledge of basic addition and subtraction.

Audience: The audience will be the teacher, serving as the assessor of the students' understanding.

Situation: Students will work individually to complete the quiz, which will cover a range of basic addition and subtraction facts and principles. The goal is for each student to showcase their individual mastery of these foundational math concepts.

Performance: Students will complete a quiz that includes a variety of addition and subtraction problems. They will apply mental math strategies, recall facts fluently, and demonstrate an understanding of the relationship between addition and subtraction. The quiz will assess their ability to solve word problems and showcase proficiency in regrouping when working with larger numbers.

Standards: The criteria for success will be based on the accuracy and efficiency of their problem-solving, application of appropriate strategies, and the demonstration of a comprehensive understanding of basic addition and subtraction principles. The assessment will align with the learning objectives and standards set for the math unit, providing insight into the students' progress and mastery of the targeted skills.

Key Criteria

- **Fluency in Recall:** Demonstrates quick and accurate recall of basic addition and subtraction facts within the specified range.
- **Mental Math Strategies:** Applies mental math strategies effectively, such as counting on, making tens, and decomposing numbers.
- **Relationship Understanding:** Clearly

Other Evidence

- **Digital Platforms:** Use of educational technology or online platforms for interactive exercises, quizzes, or games that provide additional data on individual student performance.
- **Observations:** Teacher observations during class activities, discussions, and group work to assess students' understanding, participation, and application of mathematical concepts.

explains the inverse relationship between addition and subtraction, showcasing a conceptual understanding.

- **Word Problem Solving:** Successfully solves word problems involving basic addition and subtraction, demonstrating the ability to translate real-world scenarios into mathematical expressions.
- **Regrouping Proficiency:** Shows proficiency in regrouping when adding and subtracting two- and three-digit numbers.

- **Homework Assignments:** Assignments that reinforce basic addition and subtraction skills, providing an opportunity for students to practice independently and showcasing their grasp of the concepts.
- **Math Journals:** Journal entries where students reflect on their learning, document problem-solving strategies, and articulate their understanding of addition and subtraction principles.
- **Class Discussions:** Participation in discussions about the strategies used, challenges faced, and solutions found during the learning process.

Stage 3
Learning Plan Activities:
(Teacher Driven)

How will students engage in learning?

WHERE TO elements

W - Where are we going? What is expected?

By the end of this unit, students are expected to fluently recognize and apply basic addition and subtraction facts. They should be able to evaluate and utilize these foundational math concepts effectively in various real-world scenarios.

H - How will we hook (Introduce this to) the students?

Start the unit with a hands-on activity where students use everyday objects (toys) to perform addition and subtraction. Introduce a relatable story problem involving a scenario sharing toys, highlighting the practical applications of these math operations.

E - How will we equip students for expected performances?

Provide students with a "Math Toolkit" that includes visual aids for addition and subtraction strategies, flashcards for quick recall, and a list of online resources for additional practice. Conduct a mini-lesson on mental math techniques and problem-solving approaches.

R - How will you rethink or revise?

Anticipate the challenge of regrouping. After a lesson on regrouping, assign a practice task, and conduct a quick formative assessment to identify students struggling with this concept. Provide additional guided practice and peer collaboration to address misunderstandings promptly.

E - How will students self-evaluate and reflect on their learning?

Introduce a weekly math journal where students record their understanding, challenges faced, and strategies used in solving addition and subtraction problems. Include reflection prompts like, "What did you learn this week?" and "What goals do you have for next week?"

Resources

1. Print Resources

- **Math Workbooks:** Utilize grade-appropriate workbooks that offer a variety of practice problems covering addition and subtraction.
- **Printable Worksheets:** Find or create worksheets focusing on different aspects of addition and subtraction.

2. Digital Resources

- **Khan Academy:** Online lessons, practice problems, and instructional videos on addition and subtraction.
- **Prodigy:** An adaptive math platform that engages students with game-based learning while reinforcing math concepts.

3. Manipulatives

- **Base-10 Blocks:** Physical blocks or virtual manipulatives to help visualize and understand place value.
- **Math Flashcards:** Physical or digital flashcards for quick recall and memorization.

4. Visual Aids

- **Anchor Charts:** Create visual aids with key addition and subtraction strategies using posters or large visuals.
- **Number Lines:** Physical or digital number lines for teaching and practicing addition and subtraction.

5. Project Materials

- **Construction Paper and Markers:** Materials for students to create visual representations of their understanding for projects.
- **Scenarios and Story Problems:** Printed scenarios or story problems related to real-world situations.

T - How will we tailor learning to varied needs, interests, and learning styles?

Offer differentiated learning stations. For visual learners, provide manipulatives and diagrams. For kinesthetic learners, incorporate hands-on activities. For auditory learners, include math songs or rhymes. Allow students to choose from different project options to showcase their understanding.

O - How will we organize the sequence of learning?

Organize the unit into progressive stages:

1. Introduction to basic facts and principles.
2. Mental math strategies.
3. Problem-solving with real-world scenarios.
4. Regrouping and advanced calculations.
5. Culminating project applying addition and subtraction in various contexts.

6. Math Journals

- **Blank Journals or Notebooks:** Physical journals for students to record reflections, challenges, and learning goals.

7. Learning Stations

- **Station Cards:** Clearly label different learning stations with instructions and materials for varied activities. For example, a visual station with manipulatives, a problem-solving station with real-world scenarios, a technology/digital station, etc.

Reflection
(Optional)

Were the lessons successful? How do you know? What would you do differently next time?

The success of the lessons will be evaluated through various means, including formative assessments, student engagement, and reflections. Formative assessments, such as quizzes and observations, will provide insight into individual and collective understanding. Student engagement and participation during activities, discussions, and the use of resources like BrainPOP Jr. will also be indicators of success. Additionally, reflections from both students and the teacher on the learning process and outcomes will contribute to the assessment.

If the lessons were successful, positive outcomes would include improved fluency in basic addition and subtraction, successful application of mental math strategies, and a demonstrated understanding of the inverse relationship between addition and subtraction.

If adjustments are needed, next time, I might consider varying instructional approaches to address diverse learning styles. Additionally, incorporating more real-world scenarios into the initial lessons could further enhance student engagement and application of concepts.

Intervention (What will we do if students don't learn it?)

If some students struggle to grasp the concepts, interventions could include targeted small-group instruction, additional practice sessions, and personalized feedback. Utilizing differentiated resources, such as one-on-one conferences or peer tutoring, may provide additional support. Formative assessments will guide these interventions, allowing for timely identification and addressing of specific areas of difficulty.

Enrichment (What will we do if students already know it?)

For students who have already mastered the content, enrichment activities will be implemented to deepen their understanding and challenge them further. Enrichment options may include advanced problem-solving tasks, extension projects, or opportunities to explore related concepts beyond the scope of the standard curriculum. Providing a choice of advanced projects or allowing students to mentor their peers can foster a dynamic and enriched learning environment.