AERO:SBC Basic Unit Template

Subject/Course: Math

Grade Level: Grade 5

Topic/concept: Adding and Subtracting Fractions

Estimated Time Required: 3 weeks

Desired Results:

1.What do we want students to know or be able to do? List standard(s) and relevant benchmark(s)

Numbers, Number Sense, and Estimation

1. Students will determine equivalents or approximations of common fractions.
2. Students will find common denominators.
3. Students will be able to add and subtract mixed numbers with and without regrouping and fractions with like and unlike denominators.
4. Students will use mental math and estimation strategies to predict the results of computations and to test the reasonableness of solutions.
5. Students will select and discuss the correct operation for a given problem involving positive fractions.

Connections

1.Students will develop the ability to use connections among mathematical ideas to build on one another when solving real-world problems and to interconnect ideas to produce an integrated coherent whole.

Communication and Representation

1.Students will accurately and clearly present and justify mathematical ideas verbally and in written form.

Reasoning and Proof

1.Students will apply mathematical reasoning skills to investigate, evaluate, justify, and connect approaches and solutions to situations in mathematics and in other disciplines.

Problem Solving

1.Students will apply a wide variety of mathematical concepts, processes, and skills to solve a broad range of problems in various content areas and everyday situations.

2. What are the enduring understandings that this unit is built upon?

1. Mathematics can be used to solve problems in the real world.
2. Students will recognize the importance of reasoning and proof in mathematics.

3. What essential or unit questions will prompt curiosity and focus?

Why is estimation important?
What makes an estimate reasonable?
How can I use estimation while shopping?
Why is it important to be able to add and subtract fractions?

4. In the context of this unit, what specific knowledge or skills do you want the students to acquire?

1. Estimate fractions and mixed numbers in order to be able to estimate sums and differences.
2. Add and subtract fractions with like and unlike denominators.
3. Add and subtract mixed numbers with like and unlike denominators.
4. Simplify fractions.

Evidence of Learning:
How will we know if students have achieved the desired result and can meet the standard(s) and benchmark(s)?

1. Provide a detailed description of the culminating task (summative assessment):

Problem of the Day:
Each day, students solve a word problem involving estimating, adding and subtracting fractions. They then present their solutions to the class and explain the process they used to solve the problem.

End of Unit Test
Written assessment

Project
Students design a poster to demonstrate an understanding of addition and subtraction of mixed numbers and fractions with like and unlike denominators. The poster should include the following criteria:

1.A table that compares the time it takes at least 2 classmates to complete 5 different activities. Times should be represented in fractions of hours.

2. Using data from the table, at least 1 question that involves adding fractions with like/unlike denominators.

3. Using data from the table, at least 1 question that involves subtracting fractions with like/unlike denominators.

4. Using data from the table, at least 1 question that involves adding mixed numbers with like/unlike denominators.

5. Using data from the table, at least 1 question that involves subtracting mixed numbers with like/unlike denominators.

6. At least 1 question that involves estimation.

7. Answers to all of the questions.

2. Provide the scoring guide/rubric for the culminating task (summative assessment).				
Criteria	1 - Attempts the standard	2 - Approaches the standard	3 - Meets the standard	4 - Exceeds the standard
Poster	The poster is incomplete. More than one piece of criteria is missing.	The poster includes almost all the criteria. (one piece of criteria is missing)	The poster includes all of the criteria.	The poster is eye catching and includes more than the required criteria.
Table	The table is incomplete. More than one piece of data is missing.	The table includes almost all the data. (one piece of data is missing)	The table includes all of the required data.	The table is neat and includes more than the required amount of data.
Questions	The student has not included the required number of questions (more than one is missing) The questions are confusing and hard to understand.	The student has included almost all of the required questions (one is missing) The questions are clearly written and easy to understand.	The student has included the required number of questions. The questions are clearly written and easy to understand.	The student has included more than the required number of questions. The questions are thought provoking and easy to understand.
Answers	The student has not answered all of the questions (more than one is missing) The answers are not all correct (more than one may be incorrect)	The student has answered almost all of the questions (one is missing) Almost all of the answers are correct (one may be incorrect)	The student has answered all of the required questions. The answers are all correct.	There are more questions than required, and they are all answered correctly.

Instructional Plan

Provide a plan of your instructional activities, including time and materials needed. Map out, in steps, how you will get from the introduction of the unit to its conclusion so that by the end, your students can succeed on the culminating task and meet the benchmarks. Be sure to include any formative assessments at the points in the plan when you will need them.

Day 1 Estimate fraction sums and differences (45 minutes)
1. Review front-end estimation and rounding to estimate sums and differences of whole numbers.
2. Introduce front-end estimation and rounding to estimate sums and differences of fractions. (students take notes)
3. Use number lines to estimate sums and differences of fractions.
4. Practice estimating sums and differences of fractions in small groups.
5. Students orally explain the steps they took to solve practice problems to the class.
6. Problem of the Day (Formative Assessment)
7. Assign homework

Day 2 Add fractions and mixed numbers with like denominators (45 minutes)
1. Spiral Review: Review skills learned in Day 1. (Formative Assessment)
2. Correct homework. Students volunteer to solve problems on the board and explain process. (Formative Assessment)
3. Introduce adding fractions and mixed numbers with like denominators. (students take notes)
4. Students use a number line to add fractions with like denominators.
5. In small groups, students use manipulatives to model addition of fractions with like denominators.
6. Students practice solving problems and explain their results to the class.
7. Problem of the Day (Formative Assessment)
8. Assign homework

Day 3 Add fractions with unlike denominators (45 minutes)
1. Spiral Review: Review skills learned in Day 2. (Formative Assessment)
2. Correct homework. Students volunteer to solve problems on the board and explain process. (Formative Assessment)
3. Review finding Least Common Multiples.
4. Review finding equivalent fractions.
5. Introduce adding fractions with unlike denominators. (students take notes)
6. Students complete guided practice exercises while teacher observes.
7. Students practice solving problems and explain their results to the class.
8. Problem of the Day (Formative Assessment)
9. Assign homework

Day 4 Add mixed numbers with unlike denominators (45 minutes)
1. Spiral Review: Review skills learned in Day 3. (Formative Assessment)
2. Correct homework. Students volunteer to solve problems on the board and explain process. (Formative Assessment)
3. Review finding equivalent fractions by using the least common denominator.
4. Introduce adding mixed numbers with unlike denominators. (students take notes)
5. In pairs, students use graph paper to model adding mixed numbers with unlike denominators. (Formative Assessment)
6. Independently, students complete guided practice exercises while teacher observes. (Formative Assessment)
5. Students practice solving problems and explain their results to the class.
7. Problem of the Day (Formative Assessment)
8. Assign homework

Day 5 Subtract fractions with like denominators (45 minutes)
1. Spiral Review: Review skills learned in Day 4. (Formative Assessment)
2. Correct homework. Students volunteer to solve problems on the board and explain process. (Formative Assessment)
3. Introduce subtracting fractions with like denominators. (Students take notes)
4. Students use a number line to subtract fractions with like denominators.
5. In small groups, students use manipulatives to model subtraction of fractions with like denominators. (Formative Assessment)
6. Students practice solving problems and explain their results to the class.
7. Problem of the Day (Formative Assessment)
8. Math Maintenance (Formative Assessment of what students have learned during the week)
9. Assign homework

Day 6 Subtract mixed numbers with like denominators (45 minutes)
1. Spiral Review: Review skills learned in Day 5. (Formative Assessment)
2. Correct homework. Students volunteer to solve problems on the board and explain process. (Formative Assessment)
3. Introduce subtracting mixed numbers with like denominators. (students take notes)
4. Review replacing whole numbers with equivalent fractions (i.e. 1= 3/3)
5. In small groups, students use manipulatives to rename whole numbers as equivalent fractions in order to subtract fractions with like denominators. (Formative Assessment)
6. Students practice solving problems and explain their results to the class.
7. Problem of the Day (Formative Assessment)
8. Assign homework

Day 7 Subtract fractions with unlike denominators (45 minutes)
1.Spiral Review: Review skills learned in Day 6. (Formative Assessment)
2.Correct homework. Students volunteer to solve problems on the board and explain process. (Formative Assessment)
3. Introduce subtracting fractions with unlike denominators. (Students take notes)
4. Review finding common denominators and least common denominators.
5. Independently, students complete guided practice exercises while teacher observes.
6. Students practice solving problems and explain their results to the class.
7. Problem of the Day (Formative Assessment)
8. Assign homework

Day 8 Subtract mixed numbers with unlike denominators (45 minutes)
1.Spiral Review: Review skills learned in Day 7. (Formative Assessment)
2.Correct homework. Students volunteer to solve problems on the board and explain process. (Formative Assessment)
3. Introduce subtracting mixed numbers with unlike denominators. (Students take notes)
4. Review finding common denominators and least common denominators.
5.Review converting the original fractions to equivalent fractions using the common denominator.
5. Independently, students complete guided practice exercises while teacher observes.
6. Students practice solving problems and explain their results to the class.
7. Problem of the Day (Formative Assessment)
8. Assign homework

Day 9 Problem Solving (45 minutes)

1.Spiral Review: Review skills learned in Day 8. (Formative Assessment)
2.Correct homework. Students volunteer to solve problems on the board and explain process. (Formative Assessment)
3. In small groups, students solve a variety of word problems involving adding and subtracting fractions and mixed numbers with like/unlike denominators. In turn, each group explains the strategies they used to solve the problems to the class.
8. Assign homework

Day 10 Review (45 minutes)

1.Spiral Review: Review skills learned in Day 9. (Formative Assessment)
2.Correct homework. Students volunteer to solve problems on the board and explain process. (Formative Assessment)
3.Game:
a. Have students write whole numbers on one set of flashcards and fractions on another set.
b. Have students place the cards face down in two stacks.

c. Have partners draw two cards from each stack. Each partner forms two mixed numbers and adds one to the other. Then they repeat the process, but this time they subtract.

Day 11 Summative Assessment (45 minutes)

1.Unit Test

Day 12 Project (45 minutes)

1.Introduce Project
2.Review "Time". Review the concept that 30 minutes=1/2 hour, 20 minutes=1/3 hour,15 minutes=1/4 hour, and 10 minutes= 1/6 hour.
3. Students begin to work independently on their projects.

Day 13 Project (45 minutes)

1.Students continue to work independently on their projects.

Day 14 Project(45 minutes)

1.Students continue to work independently on their projects.

Day 15 Summative Assessment(45 minutes)

1.Project presentations

Resources

Math Textbook (Houghton Mifflin)
Math Practice Workbook (Houghton Mifflin)
Teacher made Problem of the Day activities