

Tennessee Tech University
Lesson Plan Template

Name: Ms. Baker & Ms. Butler
Date: 10/22/13
Lesson Title: Adding and Subtracting Fractions With Like Denominators
Grade/Level: 4th grade

Curriculum Standards

State/Common Core Curriculum Standards

CCSS.Math.Content.4.NF.B.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.

CCSS.Math.Content.4.NF.B.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

CCSS.Math.Content.4.NF.B.3b Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.
Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.

Focus Questions/Big Idea/Goal (List all 3)

What question(s), big idea(s), and goals drive your instruction?

Question: How do you add and subtract fractions with like denominators?

Big Idea: Students need to understand that you add or subtract the numerators, and write the sum or difference of the numerators over the common denominator.

Goal: The student will understand and demonstrate correctly how to add and subtract fractions with like denominators.

Lesson Objective(s)

Objectives are measurable.

1. Students will correctly add and subtract fractions with like denominators by using manipulatives.
2. Students will correctly add and subtract fractions with like denominators without using manipulatives.
3. Students will understand that fractions can be added to make a whole.
4. Students will understand that fractions being subtracted are decomposing the whole.

Vocabulary/ Academic Language

List and define your vocabulary. What opportunities will you provide for students to practice content language/vocabulary and develop fluency?

Numerator: The top number in a fraction. It tells how many parts of the denominator are taken.

Denominator: The bottom number in a fraction. It tells how many parts it takes to make a whole.

Like Denominators: When two or more fractions have the same units.

Sum: The answer in an addition problem.

Difference: The answer in a subtraction problem.

Decompose: When you break down a whole into smaller parts that when combined, add up to make the whole.

Students will use the academic vocabulary through class and group discussions.

Material/Resources

What do you need for this lesson?

Red Cup per student

Yellow Cup per student

Green Cup per student

Traffic Light Cup Table per group

The Hershey's Milk Chocolate Fraction Book

Hershey bar per student
 Snack size bag per student
 Fraction Bars
 Fraction Human Direction Sheet
 Fraction Human Shapes
 Construction Paper
 Crayons
 Scissors
 Glue
 Adding and Subtracting Surf Boards
 Exit Ticket

Assessment/Evaluation

Formative: *How will students demonstrate understanding of lesson objective(s)? How will you monitor and/or give feedback?*

At the beginning of the lesson the students will be given 3 cups. Throughout the lesson the students will pick a cup to sit on their desk expressing how they feel about what is going on in the lesson. A green cup signals that the student is understanding what is going on and is ready to move on. A yellow cup signals that the student has questions but the questions can be answered later. A red cup signals that the student has questions and needs help before they can move on. Throughout the lesson the teacher will walk around and keep an eye on what cups are out and give further explanation when needed. When the teacher is reading the book and stops to give the students problems to solve on their own, the teacher will walk around the room to observe how the students are solving the problems. The teacher will also walk around the room and observe the students to see how they are grasping the concepts while they are working with the fraction bars and while playing the surfboard game. While the students are working with the fraction bars, the teacher will be looking to see if the students can use them properly to model fractions and to add and subtract fractions. After the students have completed the Human Fraction craft, they will turn in their completed directions sheet. The teacher will use this sheet to check the students' progress on adding and subtracting fractions.

Summative: *What evidence will you collect and how will it document student learning/mastery of lesson objective(s)*

At the end of the lesson an exit slip will be given. The exit slip will have 3 questions the students must solve from the lesson. It will be handed in as the students are leaving the room or at the end of the lesson. This will allow the teacher to see if the students have mastered the skills needed to move on to solving with unlike denominators.

<p>Instruction (Include a suggested time for each major activity)</p> <p>Total Time: 53 minutes</p>	<p>List Questions for higher order thinking <i>These cannot be answered by yes or no.</i> (Identify Bloom's Level of Thinking)</p>
<p>Set/Motivator: <i>How will you engage student interest in the content of the lesson? Use knowledge of students' academic, social, and cultural characteristics.</i></p> <p><u>Special Instructions</u> 3 mins</p> <p>At the beginning of class the teacher will pass out red, yellow, and green cups to each student. Each group of students will receive a chart that describes what each cup represents. These will be used for the Traffic Light Cups FACT. The teacher will remind students that the cup that best represents their needs should be displayed on their table. Green cups indicate that students are on task and ready to move on. Yellow cups let the teacher know that the student may have questions, but those questions can be asked later. Red cups indicate that the student cannot go on with the activity without assistance from the teacher.</p> <p><u>Hershey Bar</u> 10 mins</p> <p>The teacher will inform students that today they are going to learn how to add and subtract fractions with like denominators, and that she is going to introduce them to the topic by reading The Hershey's Milk Chocolate Fraction Book. Then the teacher will instruct the students that while she is reading the book they are going to follow along and model the addition and subtraction problems in the book with their own</p>	<p>Knowledge: When you decomposed 7 of the 12 parts of the Hershey bar into 4 of the 12 parts, how many parts of the 12 did you have left?</p>

<p>Hershey bar. Finally, the teacher will begin reading the book to the students. First the teacher will have the students model the addition problem that is in the book with their Hershey bar and then give them two more problems to model on their own. Also, the teacher will have the students model the subtraction problem that is in the book with their Hershey bar and then give them two more problems to model on their own. After the teacher has finished reading the book, she will ask probing questions to get students thinking about what they were doing with the Hershey bar. When the book is over, the teacher will tell the students to put their Hershey bar in the baggie, and they will be allowed to eat their Hershey bar at lunch.</p>	<p>Knowledge: When you combined 7 of the 12 parts of the Hershey bar with 2 of the 12 parts of the Hershey bar, how many parts of the 12 did you have in all?</p>
<p>Instructional Procedures/Learning Tasks: <i>Provide specific resources/details of lesson content and delivery.</i></p> <p>Part I Fraction Bar Addition and Subtraction 15 mins: After being introduced to adding and subtracting fractions with The Hershey's Milk Chocolate Fraction Book the students will move on to doing these type problems with fraction bars. The teacher will pass out a set of fraction bars to each student, keeping a set to model in front of the class. The teacher will have the class use the strips on their desk to follow along in solving addition and subtraction problems with like denominators. The teacher will also how fractions are decomposed for subtraction. After several problems the teacher will give the students a chance to solve some on their own. The teacher will then introduce how to solve problems without the use of fraction bars. Listed are some of the examples of problems that will be discussed: $\frac{1}{8} + \frac{1}{8}$, $\frac{1}{2} + \frac{1}{2}$, $\frac{2}{3} - \frac{1}{3}$, $\frac{4}{9} - \frac{2}{9}$, $\frac{3}{7} + \frac{2}{7}$.</p> <p>Part II Surfboard Game 10 mins: After the students practice adding and subtracting fractions the teacher will instruct the students on how to play the surfboard fraction game. The teacher will tell the students to first pick a partner and move so they are sitting in front of them. Next the teacher will pass out the surfboards (A copy of the surfboard cards is located at the end of this lesson), and instruct the students to place all the surfboards face down. The teacher will tell the students that some of the cards have subtraction problems and some have addition problems, and the object of the game is to have more surfboards than your partner at the end of the game. The students will have to add or subtract their fraction problem in their head, compare their answer to their partner's, and whoever has the largest fraction wins and gets to keep both surfboards. When all of the surfboards are collected, the game is over. While the students are playing the game, the teacher will walk around the room to observe the students and ask probing questions about how they are getting their answer.</p> <p>Part III Human Fraction Craft 15 mins: To give the students more practice the teacher will inform the students that they are going to do the Human Fraction craft. The teacher will tell the students they are to follow the directions, which includes addition and subtraction fraction problems, in order to cut the shapes to create the body parts. After the shapes are cut out the students are to color and glue the shapes on a piece of construction paper to make a person. The students will have to name their person and write the name at the top of the paper. After the Human Fraction is complete the teacher will ask a few students to present their person, go over the answers to the problems in the directions by having the students provide the answers, and ask students to share a rule for adding and a rule for subtracting fractions.</p> <p>*The shapes and directions for the craft are located at the end of the lesson</p>	<p>Analysis: How were you able to compute those fractions quickly in your head? What is another strategy you could have used?</p> <p>Analysis: Is the answer to $\frac{5}{8} - \frac{2}{8}$ closer to 0 or $\frac{1}{2}$? Explain.</p> <p>Create: Decompose $\frac{5}{8}$ into an addition equation? Is there another equation you could write? If so, write one.</p> <p>Evaluate: Is adding the numerators and then adding the denominators a good rule for adding fractions with like denominators? Why or why not? If not, what would be a better rule?</p>

Closure: *Verbalize or demonstrate learning or skill one more time. May state future learning.*
Following the lesson an exit slip will be given to the students. The exit slip will have 3 questions the students must solve from the lesson. It will be handed in as the students are leaving the room. This will serve as a summative assessment to see if the students have mastered the skills needed to move on to solving with unlike denominators.

Adaptations to Meet Individual Needs: *How will you adapt the instruction to meet the needs of individual students? Include - ELL?; SPED?; Gardner's Learning Styles - Name and specify what happens in the lesson that uses each learning style listed; Other individual needs of the students/class you are teaching?*

This lesson specifically addresses *logical-mathematical, kinesthetic, spatial, intrapersonal, and interpersonal* learning styles in order to help students with varied learning styles learn concepts about adding and subtracting fractions with like denominators. Each part of the lesson addresses the logical-mathematical learning style. Each part has some information conveyed by numbers. The activities with Hershey's bar, fraction bars, Human Fraction craft, and surfboard fraction cards all have physical or hands on actions which address the kinesthetic learning style. The fraction bar activity and the Human Fraction craft specifically address the spatial learning style with the different colors and shapes used. Intrapersonal and Interpersonal learning styles are both addressed throughout the lesson when the students must work alone and in groups to solve and explain problems.

Management/Safety Issues:

Students should be reminded that when they are using scissors they need to be cautious. The teacher should monitor the students while they are using scissors to make sure they are being safe. Also, the teacher needs to make sure that there are no food allergies with chocolate. If a student is allergic to chocolate, the teacher can make a print out of a Hershey bar and cut out the 12 pieces for that student, and give them another kind of candy to have at lunch.

Rationale/Theoretical Reasoning:

Rationale/Common Misconceptions:

Students tend to believe that when adding fractions, even fractions with like denominators, they are to add the numerators and the denominators. Some may not realize that in adding fractions you are counting parts of a whole, so the parts must be the same size, and the way to do that is to keep the denominator the same. In this lesson the students will have an opportunity to do the same problem in both of the ways to see if they get the same answer. After they do not get the same answer, the teacher will have the students to come of with their own explanations for the differing answers and for which procedure is correct.

Bay-Williams, Jennifer M., Karp, Karen S., and Van De Walle, John A. *Elementary and Middle School Mathematics Teaching Developmentally*. 8 ed. New Jersey: Pearson, 2013. Print.

Students think that they can use any combination of models when finding the sum or difference of fractions. They may represent one fraction with a hexagon and the other fraction with a rectangle. They need to know that the models need to represent the same whole, so they have to use the same model for each fraction in the problem.

Information found: <http://katm.org/wp/wp-content/uploads/flipbooks/4FlipBookedited.pdf>

Multiple Intelligences:

This lesson specifically addresses logical, kinesthetic, spatial, intrapersonal, and interpersonal learning styles in order to help students with varied learning styles learn concepts about adding and subtracting fractions with like denominators.

How this lesson incorporates these theories is discussed in the "Adaptations to Meet Individual Needs" section.

Gardner, H. (2000), *Intelligence reframed: Multiple intelligence for the 21st century*. New York: Basic Books

Vygotsky:

This lesson also incorporates Lev Vygotsky's Sociocultural Theory by having the students work with partners during the

surfboard game, and when students are working on the Human Fraction they will be creating their own, but they will be working in a group setting, which allows student to student interaction. Also students will be participating in group and whole class discussions, which helps students to construct understanding from listening to each other's ideas. Vygotsky, L.S. (1978). *Mind in society. The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Bloom's Taxonomy:

The teacher is emphasizing Benjamin Bloom's Taxonomy by asking more knowledge, create, analyze, and evaluate questions. These questions can't be answered by a no or yes answer, but instead an answer that involves a higher order of thinking. From these questions, students will gain a greater understanding of the concepts for adding and subtracting fractions with like denominators when closely analyze them and apply their understanding to create strategies. Bloom's Taxonomy. (n.d.). Retrieved from http://www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm

Bruner:

The teacher is using Jerome Bruner's Constructivist Theory to help students to construct their own knowledge. For example, the teacher will give the students an opportunity to create their own strategies for solving the addition and subtraction problems and ask them if they can come up with another one.

Constructivist Theory. (n.d.). Retrieved from <http://www.instructionaldesign.org/theories/constructivist.html>

Marzano's Nine Instructional Strategies for Effective Teaching and Learning:

Reinforce Effort and Providing Recognition: Showing the connection between effort and achievement helps students see the importance of effort and allows them to change their beliefs to emphasize it more. In this lesson, the teacher will be walking around and visiting each group of students to "Pause, Prompt, Praise." If a student is struggling, pause to discuss the problem, prompt with specific suggestions to help improve, and if the student's performance improves as a result, offer praise. Also, the traffic light FACT will provide opportunities for the teacher to do this as well.

Nonlinguistic Representations: Has recently been proven to stimulate and increase brain activity. In this lesson, the students will have an opportunity to use the fractions strips when adding and subtracting the fractions.

Cooperative Learning: Has been proven to have a positive impact on overall learning and will be used in this lesson when the students are playing the surfboard game with a partner and creating their own Human Fraction in a group environment.

Setting Objectives and Providing Feedback: This strategy provides students with a direction. The teacher sets objectives for the students that are measurable and provides feedback throughout the lesson. During the surfboard game and the craft the teacher will visit each group of students to provide them with feedback.

Information taken from <http://www.middleweb.com/MWLresources/marzchat1.html>

References: *List the references used in this lesson*

Vocabulary Definitions:

Bay-Williams, Jennifer M., Karp, Karen S., and Van De Walle, John A. *Elementary and Middle School Mathematics Teaching Developmentally*. 8 ed. New Jersey: Pearson, 2013. Print.

Surf Board Game:

<http://www.teacherspayteachers.com/Product/Adding-and-Subtracting-Fractions-with-Like-Denominators-251862>

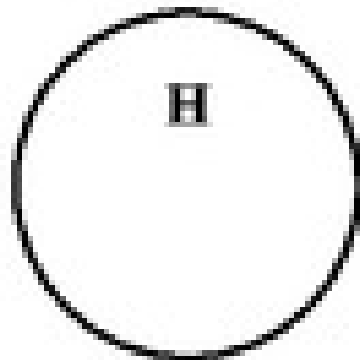
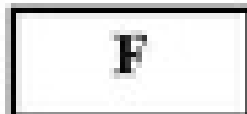
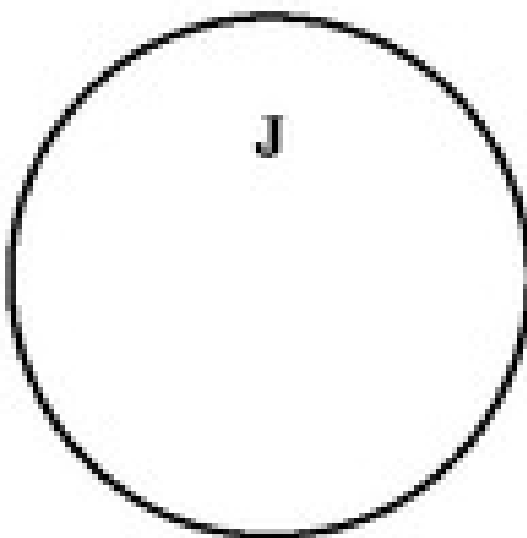
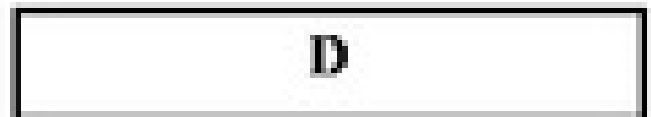
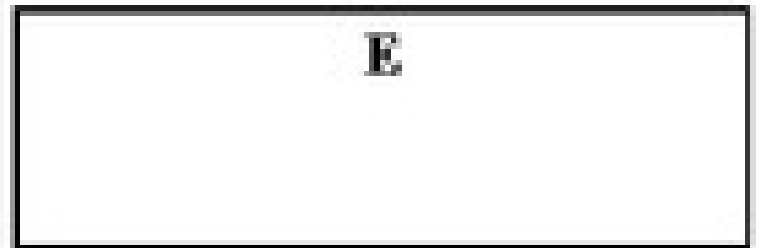
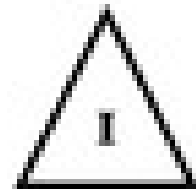
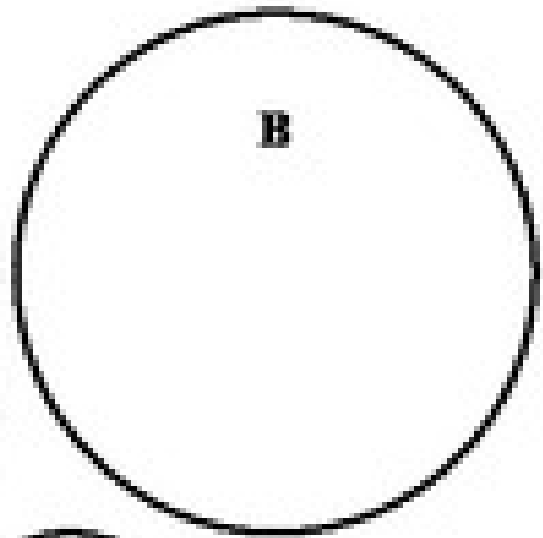
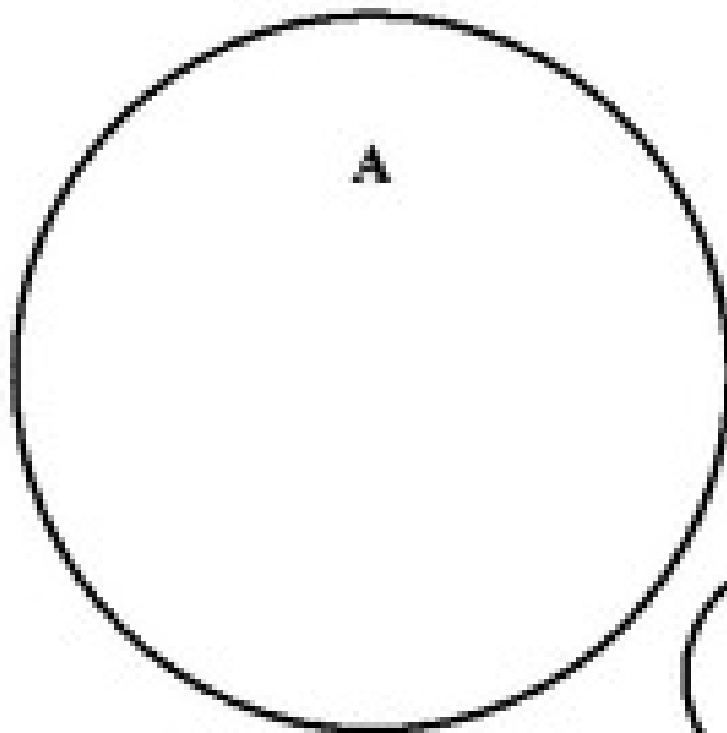
Human Fraction Craft:

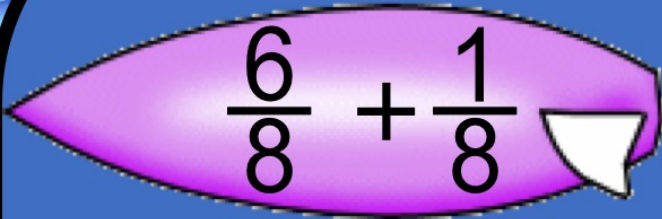
<http://www.teachingwithamountainview.com/2013/03/our-latest-fraction-projects.html>

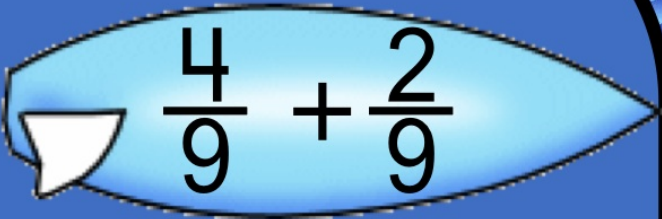
Reflections/Future Modifications: *To what extent did the class learn what you intended them to learn? What will be your next steps instructionally? What did you learn about your students as learners? What have you learned about yourself as a teacher?*

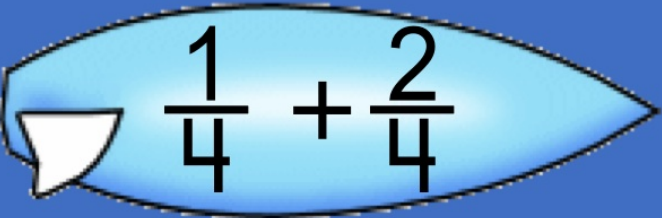
Fraction Human

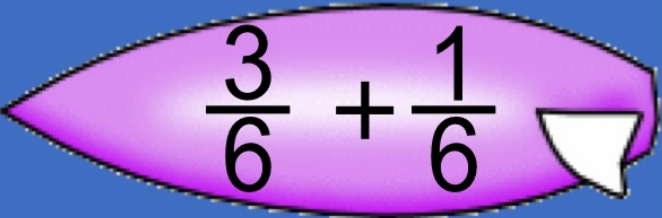
1. Use $\frac{3}{3} - \frac{1}{3} =$ _____ of circle A for the person's body.
2. Use $\frac{1}{4} + \frac{3}{4} =$ _____ of circle B for the person's head.
3. Divide circle C in half. Use $\frac{2}{8} + \frac{2}{8} =$ _____ of circle C for one ear and the other $\frac{8}{8} - \frac{4}{8} =$ _____ of circle C for the other ear.
4. Use $\frac{1}{4} + \frac{1}{4} =$ _____ of rectangle D for one arm. Use the other $\frac{4}{4} - \frac{2}{4} =$ _____ of rectangle D for the other arm.
5. Use your estimate of $\frac{1}{5} + \frac{1}{5}$ (closer to 0, $\frac{1}{2}$, or 1) to cut rectangle E. Use one part of rectangle E as one leg and use the other part as the other leg.
6. Divide rectangle F into 5 parts. Use $\frac{5}{5} - \frac{4}{5} =$ _____ for each finger on one arm.
7. Divide rectangle G into 5 parts. Use $\frac{1}{5} + 0 =$ _____ for each finger on the other arm.
8. Divide circle H into 3 parts. Use $\frac{3}{3} - \frac{2}{3} =$ _____ for the person's smile
9. Use $\frac{1}{2} + 0 =$ _____ of triangle I for one eye and $\frac{1}{2} - 0 =$ _____ of triangle I for the other eye.
10. Use your estimate of $\frac{3}{3} - \frac{2}{3}$ (closer to 0, $\frac{1}{2}$, or 1) to cut circle J and use as the person's hat.
11. Use $\frac{1}{3} + 0 =$ _____ of rectangle K for one of the person's feet and $\frac{1}{3} - 0 =$ _____ of rectangle K for the other foot.
12. Use the remaining part of rectangle K to put a feather in the person's hat.

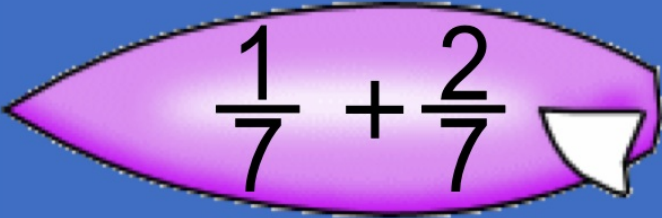


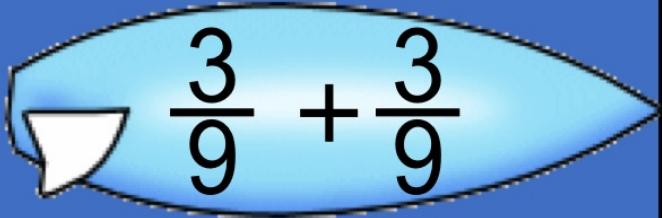

$$\frac{6}{8} + \frac{1}{8}$$

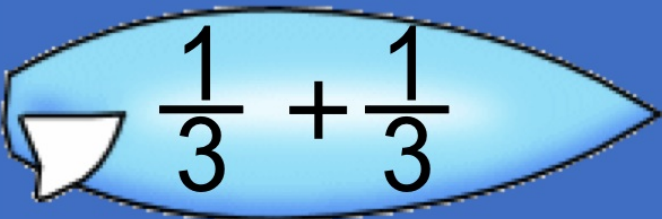

$$\frac{4}{9} + \frac{2}{9}$$

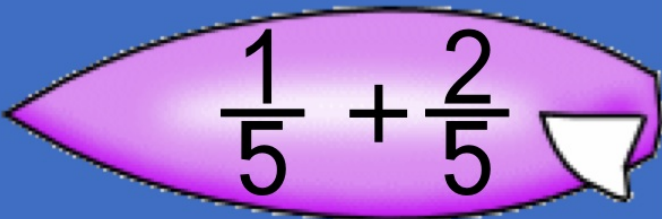

$$\frac{1}{4} + \frac{2}{4}$$

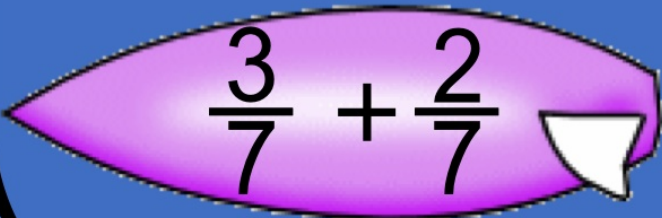

$$\frac{3}{6} + \frac{1}{6}$$

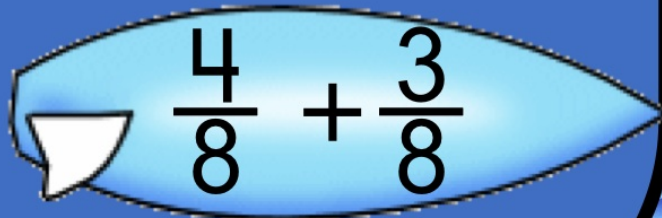

$$\frac{1}{7} + \frac{2}{7}$$

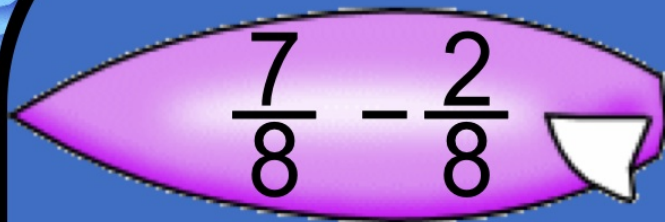

$$\frac{3}{9} + \frac{3}{9}$$


$$\frac{1}{3} + \frac{1}{3}$$

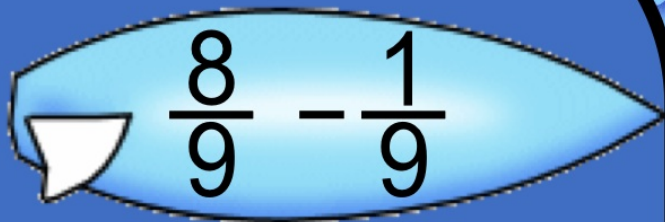

$$\frac{1}{5} + \frac{2}{5}$$


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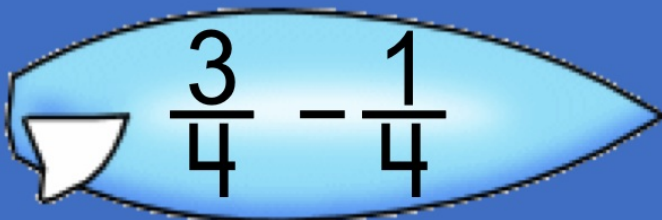

$$\frac{4}{8} + \frac{3}{8}$$



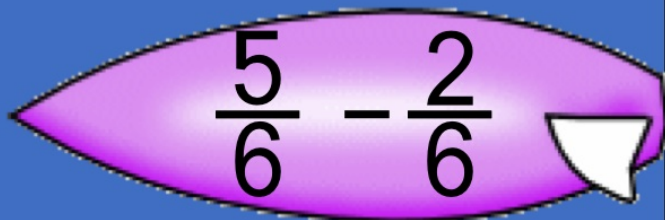
$\frac{7}{8} - \frac{2}{8}$



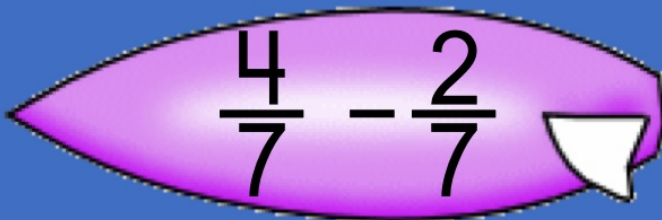
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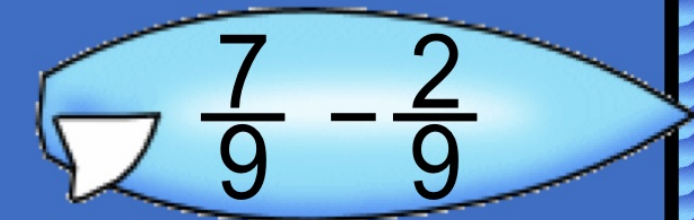
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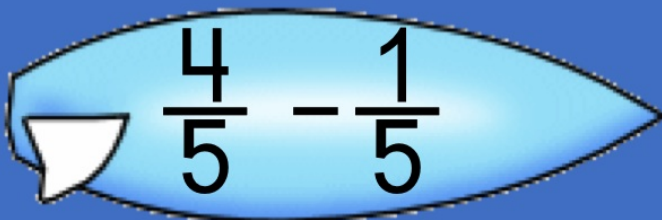
$\frac{5}{6} - \frac{2}{6}$



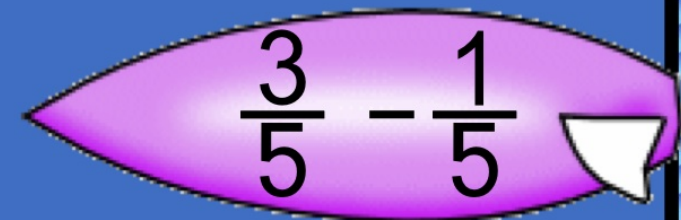
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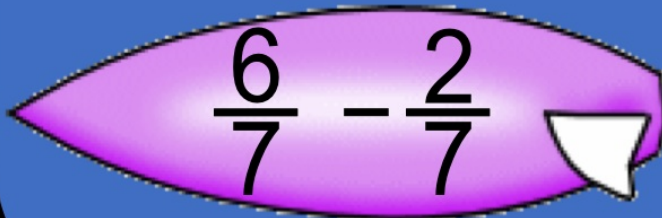
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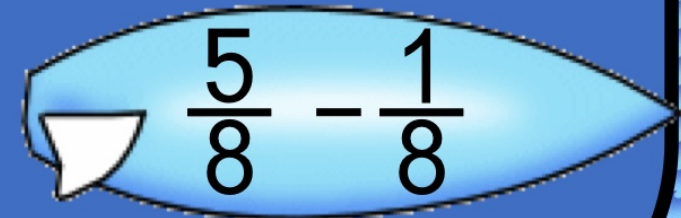
$\frac{4}{5} - \frac{1}{5}$



$\frac{3}{5} - \frac{1}{5}$



$\frac{6}{7} - \frac{2}{7}$



$\frac{5}{8} - \frac{1}{8}$

Exit Ticket

1. $6/12 + 5/12 =$ _____

2. $4/8 - 2/8 =$ _____

3. Decompose $10/12$ into a sum of fractions

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