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Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[](http://allrecipes.com/recipe/todds-famous-blueberry-pancakes/photo-gallery.as)

\_\_\_\_\_ friends have ordered Big, Big Blueberry Pancakes at Big Bob’s Breakfast Place. The waiter brings \_\_\_\_\_ Big, Big Blueberry Pancakes to their table. If the friends share the pancakes evenly, how much can each child have?

(2, 3) (4, 3) (4, 5) (8, 5)

Justify your solution with numbers, pictures, and/or words.

* What standards does this lesson address?
  + 5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*
  + For this lesson we are focusing on adding fractions with like denominators (a prerequisite to this standard – necessary to address during this implementation period to address gaps in understanding)
* Why were these number sets chosen for this problem?
  + The number sets for this problem are (2,3) (4, 3) (4,5) (8, 5)
  + Each of these number sets has 2, 4 or 8 friends sharing something. Having 2, 4, or 8 friends allows for answers that are halves, fourths, or eighths which are easiest for students to reason about sizes and equivalence.
* What are some expected student strategies and misconceptions? How can I address these strategies and misconceptions in our class discussion?

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| --- | --- | --- |
| **Number Set** | **Possible Student Strategies and Misconceptions** | **Possible Ways to Address Strategies and Misconceptions in Class Discussion** |
| **Strategy 1**  (2, 3)  2 friends sharing 3 pancakes | Pancake 2 sharing 3 answer.JPGPancake 2 sharing 3.JPG | This student has correctly cut each pancake so that both friends receive an equal sized piece from each pancake.  This student has correctly labeled the pieces as ½ of a pancake.  \*Make sure a student using this strategy writes a number sentence. If he did not, have the class help him write one.  If a student answers 3/2 or “three halves” it is OK! Three halves or 3/2 is a correct answer to this problem and helps students make a connection between the addition number sentence and the answer. Try to find a student who answered 1 and ½ pancakes and discuss whether or not those answers are the same or different. This will lead to a nice equivalence discussion. |
| **Number Set** | **Possible Student Strategies and Misconceptions** | **Possible Ways to Address Strategies and Misconceptions in Class Discussion** |
| **Strategy2**  (2, 3)  2 friends sharing 3 pancakes | Pancake 3.JPG | This student has correctly shared the pancakes so that each friend receives a whole pancake and a half of the last pancake.  \*Make sure a student using this strategy writes a number sentence. If she did not, have the class help her write one.  Make a connection between this strategy and strategy 1. Is the answer 1 and ½ pancakes the same as 3/2 pancakes? Rather than teaching them how to convert from improper to mixed, have students prove it by reasoning about the picture and the problem context.  (Example “I know if you have 2 halves that makes a whole, so 3 halves would be 1 and ½”.) |
| **Strategy 3**  (2, 3)  2 friends sharing 3 pancakes | Pancake 4.JPG | This student understands that the context of this problem is a division problem and has correctly chosen which number is the dividend (3) and which number is the divisor (2).  Ask the student to explain her strategy in the context of the problem. You may find that this student has little understanding about why this division works and what her answer really means.  If a student answers 1 r 1 – ask “What does “r 1” mean?” and “Does anyone see ‘r 1’ in the other strategies (in the pictures from strategy 1 and 2)?” Try to help the class see that if they give each friend a pancake, they will have 1 whole pancake left over.  If a student answers 1 and ½ - ask “Where did ½ come from?” Look for answers that connect the numbers to the context of the problem (example “they would each get ½ of the third pancake”) and avoid accepting answers that make no connection to the context (example: “I saw the 1 down at the bottom and the two on the outside so it is ½”). If a student gives an explanation that makes no connection to the context, ask questions to him and/or the class to help connect the numbers back to the story and other strategies. |
| **Number Set** | **Possible Student Strategies and Misconceptions** | **Possible Ways to Address Strategies and Misconceptions in Class Discussion** |
| **Misconception 1**  (2, 3)  2 friends sharing 3 pancakes | pancake 5.JPG | This student has a similar strategy to strategy 1. The main difference is this student does not know what to call his pieces. While this answer IS correct, it does not help us meet the standard of adding fractions. Ask the student “What size are those pieces” and then challenge this student to write a number sentence to match his thinking (similar to the number sentence in strategy 1). |
| **Misconception 2**  (2, 3)  2 friends sharing 3 pancakes | pancake 5.JPGPancake 2 sharing 3.JPG | This student has correctly determined that each friend will get a fair share (one half) of each pancake, but has a misconception about what those pieces make when put together.  This is a very common misconception when adding fractions! If you see this happen in your classroom, be sure that it is shared during your discussion.  This student is stating that each friend will get 3/6 of a pancake which is completely false because he is saying that that each friend will get ½ of a pancake. They see 3 pieces out of 6, but ask “what size are those pieces?” so that the student comes to an understanding that each friend gets 3 pieces that are one half of a whole pancake, so 3 half pancakes (3/2 or 1 and ½). Try to make a connection between this strategy and strategies 1 and 2 above. This student has a nice understanding of equal sharing, but is confused about how to combine fractional parts. |
| **Number Set** | **Possible Student Strategies and Misconceptions** | **Possible Ways to Address Strategies and Misconceptions in Class Discussion** |
| 4 friends sharing 3 pancakes |  | Strategies and misconceptions for this number set will be similar to those for 2 friends sharing 3 pancakes.  \*With these last number choices, you may find situations where addition of fractions with uncommon denominators is necessary. You may choose to address this in your discussion, or save it for the next week when that is the learning goal. If you chose not to address how to add ½ and ¼ (for example) you can accept ½ and ¼ as a correct answer.  \*Students using “long division” may struggle with this number set. When the try 3 divided by 4, they may feel it “looks wrong” because the bigger number is the divisor (on the outside, not underneath the division sign). They will often switch the numbers to 4 divided by 3, which “looks easier” and come up with the answer of 1 and 1/3. If this happens, bring it up in the discussion and ask “Can it be possible for each friend to have a whole pancake? Does this make sense in our story?”  **Possible Answers**  ¼ + ¼ + ¼ = ¾  3 pieces (ask “what size are the pieces”)  3/12 (incorrect – this student is thinking 3 pieces out of 12 total, but ask “what size are the pieces”) |
| 4 friends sharing 5 pancakes |  | Strategies and misconceptions for this number set will be similar to those for 2 friends sharing 3 pancakes. |
| 8 friends sharing 5 pancakes |  | Strategies and misconceptions for this number set will be similar to those for 2 friends sharing 3 pancakes. |