Mathematics Teaching Institute
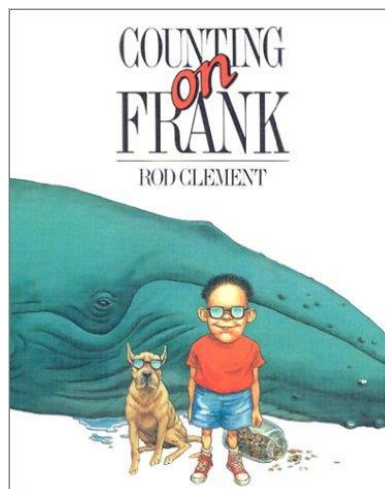
July 27-31, 2015

K – 5 Band

Learning Experiences: *Multi-digit Addition and Subtraction*

All activities based on the book, <u>Counting on Frank</u> by Rod Clement.

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Standards:

2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction

2.NBT.B.6 Add up to four two-digit numbers using strategies based on place value and properties of operations

2.NBT.B.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

3.NBT.A.2 Number & Operations in Base Ten

Use place value understanding and properties of operations to perform multi-digit arithmetic

Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Learning Goals

1. Students will be able to add multi-digit numbers
2. Students will be able to combine like sets
3. Students will be able to mentally perform tasks appropriate to their developmental level
4. Students will be able to choose strategies appropriate to the task

<u>Activity 1: Number Talk</u>

Learning Goals:

Students will be able to mentally use appropriate strategies to solve.

Learning Experience:

After reading <u>Counting on Frank</u> aloud, the teacher will engage students in a daily Number Talk.

The teacher will present the following problems to be solved mentally by the students. Students will indicate when they have an answer and through teacher-led discussion, students will share answers verbally. The teacher should scribe answers.

Present: *2nd grade: 24 + 15 =*

3rd grade: 86 – 24=

This activity encourages students to solve two-digit addition/subtraction through the use of mental math. Throughout this activity, the teacher should encourage students to solve this mentally and compare their answers to that of their peers for like strategies.

Standards for Practice:

1. Make sense of problems and persevere in solving them
2. Model with mathematics (through teacher as a scribe, students will explain their thinking)

Materials:

<u>Counting on Frank</u>, by Rod Clements

Chart paper or white board for scribe

Procedures:

Students will see the problem "24 + 15" written on board/chart paper and be given think time to solve. Students will place their "thumbs up" sign on their chest when they feel they have an answer they are ready to share.   The teacher will call on individuals and scribe answers, checking for understanding and clarification. Teacher will then ask students to indicate if they arrived at the answer using the same answer.

Assessment:

Teacher observation, informal assessment

Activity #2: Jelly Bean Activity (Rich Task)

You had 745 jelly beans. You ate some jelly beans and now you have 642 jelly beans. How many have you eaten? Use pictures, words, or manipulatives and be prepared to explain your thinking.

Learning Goals:

The students will be able to use various strategies to solve.

Learning Experience:

The teacher should present the story problem to the students. Through the availability of manipulatives and classroom tools, the students should be able to solve the problem using strategies appropriate to their developmental level. Students will reconvene after being provided time and freedom to solve and be able to explain their solutions and the thinking that led to that solution.

Standards for Practice:

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision

Materials:

-Handout with problem written at the top and space for a solution

-manipulatives such as, but not limited to, base-10 blocks, unifix cubes, number line, paper/pencil/writing utensil, post-it notes, etc.

Procedures:

Students will be given the paper. Teacher will read the story to the students and review expectations and standards of behavior during exploration of solutions. Students will then actively participate in finding solutions to the given story problem. Students will then reconvene and discuss their solutions, allowing for validations and explanation of strategies.

Adaptations:

Early finishers will be encouraged to find a second way to solve the problem.

Assessment:

Teacher observation, informal assessment

Name _____

You had 745 jelly beans. You ate some jelly beans and now you have 642 jelly beans. How many have you eaten? Use pictures, drawings, words, or manipulatives and be prepared to explain your thinking. Record your solution.

Solution #1

Solution #2

Activity #3: A roomful of Franks

Frank's "pet" boy calculates that twenty-four Franks could fit into his bedroom. What if, in addition to these twenty-four Franks, thirty Franks could fit into the boy's parents' bedroom, twenty-five in the living room, and ten in the bathroom? How many Franks in all would fit into the boy's house? Use pictures, words, or manipulatives and be prepared to explain your thinking.

Learning Goals:

The students will be able to use various strategies to solve.

Learning Experience:

Students will be asked to add 4 2-digit numbers through exploration and problem-solving.

Standards for Practice:

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision

Materials:

-Handout with problem written at the top and space for a solution

-manipulatives such as, but not limited to, base-10 blocks, unifix cubes, number line, paper/pencil/writing utensil, post-it notes, etc.

Procedures:

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Adaptations:

Early finishers will be encouraged to find a second way to solve the problem.

Assessment:

Teacher observation, informal assessment

Source: Counting on Frank by Rod Clement

Name _____

Frank's "pet" boy calculates that twenty-four Franks could fit into his bedroom. What if, in addition to these twenty-four Franks, thirty Franks could fit into the boy's parents' bedroom, twenty-five in the living room, and ten in the bathroom? How many Franks in all would fit into the boy's house?   Use pictures, drawing, words, or manipulatives and be prepared to explain your thinking. Record your solution.

Solution #1

Solution #2

Activity #4: Peas

If you dropped 15 peas on the floor each night, how many peas would be on the floor at the end of the week? At the end of a month? Use pictures, words, or manipulatives and be prepared to explain your thinking.

Learning Goals:

The students will be able to use various strategies to solve.

Learning Experience:

Students will be asked to add 4 2-digit numbers through exploration and problem-solving.

Standards for Practice:

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision

Materials:

-Handout with problem written at the top and space for a solution

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Assessment:

Teacher observation, informal assessment

Name _____

If you dropped 15 peas on the floor each night, how many peas would be on the floor at the end of the week? At the end of a month? Use pictures, drawing, words, or manipulatives and be prepared to explain your thinking. Record your solution.

Solution #1

Solution #2