

Addition & Subtraction within 20

Target Grade Level K-2

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Activity #1
Addition and Subtraction
Word Problems to 20

Learning Goal: Students will be able to read a math story problem and choose to add or subtract based on the information contained in the problem. They will use basic computation skills to solve the problem while writing a number sentence or drawing a model as well as using various math manipulatives. Students will collaborate to check their answers with a partner at the end of the activity.

Common Core Standard:

- 1.OA.1: Use addition and subtraction within 20 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.
- K.RF.4: Read emergent-reader texts with purpose and understanding.
- 1.RF.1.4A: Read grade-level text with purpose and understanding.
- 2.RF.2.4A: Read grade-level text with purpose and understanding.

Mathematical Practices: One of the most relevant Mathematical Practices would be to *make sense of problems and persevere in solving them*. Students will need to visualize the story problem, choose manipulatives to use in their exploration to solve the word problem and show perseverance in solving the problem.

The other Mathematical Practice would be *Model with mathematics*. Students will be solving real world math story problems that they can visualize. They will then have to reason to choose the strategy that will work best for them to solve the problem.

Materials:

- Math story problem task cards
- Various math manipulatives- counting cubes, linking cubes, red/yellow counters, etc.
- Crayons or pencils
- Paper
- Student recording sheet
- Velcro *optional to hang cards around the room

Procedures:

Students have been working on story problems to 20 in whole group guided setting. The teacher can laminate and cut the cards to either be hung with Velcro around the room as a walk the room activity or put at a center. Students would have a recording sheet and a pencil. They could either walk around the room and choose a card or while at the center choose a card. Students would choose the manipulatives they would like to use to solve the problem. After solving all 20 problems students would find another student who was also finished and check their work with their partners. Discussion would take place on the different strategies they used to solve the various problems.

Guided Questions:

What do you see?

What are you thinking?

Where are you going to start?
How did you count?
What did you add in this problem?
Why did you choose to add these numbers?
What did you subtract with this problem?
Why did you choose to subtract these numbers?
You're using a number line, how did you decide to count left or right?
How did you count up?
How did you count down?
Are you right?
How do you know you're right?
What strategy did you use?
Is there another strategy you could have used?
What was the most efficient strategy used in our class?
Did you have a name for your strategy?

Adaptations for students:

If a student is easily solving the word problems teachers could have another group of story problem cards that have more than two addends, adding or subtracting two digit numbers to 30 or more, or even problems where students must add and subtract within one problem.

If a student is struggling to solve the word problems, teachers could have another group of story problem cards that have a sum of 10 or 15. Teachers could ask the student to pick a strategy and allow the child to talk their way through the process with the teacher or student to identify misconceptions.

Assessment Plan:

A story problem within 20 that students must solve on their own exit slip.

www.k-5mathteachingresources.com/1st-grade-number-activities.html

Activity #2 Panda Math

Learning Goal: Students will be able to interpret a math story problem and choose to add or subtract based on the information contained in the problem. They will use basic computation skills to solve the problem while writing a number sentence or drawing a model as well as using various math manipulatives. Students will collaborate to check their answers with a partner at the end of the activity.

Common Core Standard:

- 1.OA.1: Use addition and subtraction within 20 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.

Mathematical Practices: One of the most relevant Mathematical Practices would be to *make sense of problems and persevere in solving them*. Students will need to visualize the story problem, choose manipulatives to use in their exploration to solve the word problem and show perseverance in solving the problem.

The other Mathematical Practice would be *Model with mathematics*. Students will be solving real world math story problems that they can visualize. They will then have to reason to choose the strategy that will work best for them to solve the problem.

Materials:

- Various math manipulatives- counting cubes, linking cubes, red/yellow counters, etc.
- Crayons or pencils
- Paper

- Student recording sheet
- Puppets or toy animals
- Trays, Plates
- Tenframes

Procedures:

The Activity

Pirate Panda has taken all the treasure, 20 golden coins. Cat, Dog and Rabbit jump about excitedly, “Can we have some too?”

“No! No! No!” says Pirate Panda.

Can the children suggest what Panda ought to do?

Guided Questions:

Is it fair? Have they all got the same amount? Is it fair now?

Recording

Could you draw a picture to show panda what to do in order to be fair?

Reasoning

Why is this fair/not fair? How do you know?

Opening out

What if we give them another one each?

Sheep comes along - what should we do now?

Bear comes too, so what could we do about the remainder? What else could we do?

What do you see?

What are you thinking?

Where are you going to start?

How did you count?

What did you add in this problem?

Why did you choose to add these numbers?

What did you subtract with this problem?

Why did you choose to subtract these numbers?

You’re using a number line, how did you decide to count left or right?

How did you count up?

How did you count down?

Are you right?

How do you know you’re right?

What strategy did you use?

Is there another strategy you could have used?

What was the most efficient strategy used in our class?

Did you have a name for your strategy?

Adaptations for students:

You could start the story with Panda sharing unfairly, provoking the children to comment. The numbers chosen determine the level of challenge: 20 shared between four toys encourages counting up to 5 for younger children. You might simplify the problem by having two then three characters, but use larger numbers for expert counters.

Deliberately choosing numbers which create remainders, like 4 or 5 shared between three, offers opportunities for alternative solutions such as fractions, subtracting some or adding some more.

Problems such as 7 shared between four offer more challenging multistep solutions.

Toys and objects could fit with a current interest, such as a teddy bear party.

Use a real context such as sharing fruit. This would encourage discussion of fractions, especially if there was a ‘bigger half’!

Other contexts include sharing bulbs between containers or sharing resources for art work. You could use Numicon or ten frames to check that everyone has the same amount, or arrange coins on trays or plates.

Large numeral cards will emphasise whether everyone has the same number and encourage discussion about comparing numbers if the sharing is unfair. These could be supported by dot patterns on card, Numicon or other representations of amounts.

For those that need more of a challenge, you could build upon the mathematical concepts from this problem by reading aloud and exploring math concepts in the book *Panda Math: Learning about Subtraction from Hua Mei and Mei Sheng* by Ann Nagda.

Assessment Plan:

A story problem within 20 that students must solve on their own exit slip.

www.Nrich.maths.org

Activity #3 “Dealing with Addition”

Learning Goal: Students will find multiple ways to make a given number using numbers up to 20 using addition and subtraction. Student will work in small groups of 3 or 4 or individually.

Common Core Standard

1.OA.A.2 – Represent and solve problems involving addition and subtraction.

Mathematical Standards:

Students will be able to make sense of problems and persevere in solving them. Students will be able to use appropriate tools strategically. Students will be able to attend to precision.

Materials:

“Dealing with Addition” by Lynette Long, Ph. D.

Decks of playing cards

Sets of index cards with numbers 1 through 20 on

Procedures:

Read the book “Dealing with Addition” to the students. With a partner pick a numbered index card out of the stack. Pick four cards to review with partner to make equations to equal the number that is on the index card. To progress then pick one index card and have each partner pick four cards and come up with their own equations to equal the drawn index card number.

Guided Questions:

What do you see?

What are you thinking?

Where are you going to start?

How did you count?

What did you add in this problem?

Why did you choose to add these numbers?

What did you subtract with this problem?

Why did you choose to subtract these numbers?

Are you right?

How do you know you're right?

What strategy did you use?

Is there another strategy you could have used?

What was the most efficient strategy used in our class?

Did you have a name for your strategy?

Adaptations for students:

If a student is easily solving math equations have the student try to add either multiplication and division.

Assessment plan:

Exit slip with different equations adding up to the numbers that were assigned for the exit slip review.

Activity #4
Addition and Subtraction
Word Problems to 20

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Common Core Standard:

- 1.OA.1: Use addition and subtraction within 20 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.
- K.RF.4: Read emergent-reader texts with purpose and understanding.
- 1.RF.1.4A: Read grade-level text with purpose and understanding.
- 2.RF.2.4A: Read grade-level text with purpose and understanding.
- Social Studies - Jobs

Mathematical Practices: One of the most relevant Mathematical Practices would be to *make sense of problems and persevere in solving them*. Students will need to visualize the story problem, choose manipulatives to use in their exploration to solve the word problem and show perseverance in solving the problem.

The other Mathematical Practice would be *Model with mathematics*. Students will be solving real world math story problems that they can visualize. They will then have to reason to choose the strategy that will work best for them to solve the problem.

Materials:

- Book, by Mem Fox, Let's Count Goats
- Various math manipulatives- counting cubes, linking cubes, red/yellow counters, etc.
- Crayons or pencils
- Paper

Procedures: Teacher will read Let's Count Goats together as a whole class. As Teacher is reading, students will answer the text questions. After reading, students will pair up in small groups with their own copy of the book and pick a job or activity that the goats are doing in the book and create number sentences for them such as 'There are 3 goats flying planes, how many are sitting in the plane?' Students can switch groups to solve other number sentences. As a SS extension students can count the goats in different jobs and graph results.

Guided Questions:

What do you see?

What are you thinking?

Where are you going to start?

How did you count?

What did you add in this problem?

Why did you choose to add these numbers?

What did you subtract with this problem?

Why did you choose to subtract these numbers?

You're using a number line, how did you decide to count left or right?

How did you count up?

How did you count down?

Are you right?

How do you know you're right?

What strategy did you use?

Is there another strategy you could have used?

What was the most efficient strategy used in our class?

Did you have a name for your strategy?

Adaptations for students:

Students could create harder questions such as "If there are 5 goats and each goat has 2 floppy ears, how many floppy ears do the 5 goats have?" Or "If there are 4 goats with 2 floppy ears and 4 hooves, how many ears and hooves?"

If a student is struggling to write their own word problems, allow them to work with a partner and walk through the process.

Assessment Plan:

Student generated questions