

## GPB Kindergarten Session Resource Packet

**You will need the following materials while participating in the session:**

K Handout Sets 1 and 2

Large index card

Tape

This resource packet

Note taking materials

### **Session Format:**

- Why CCGPS?
- How to read the standards
- Kindergarten Overview
- What's New in Kindergarten
- Six Lenses
- Focus Activity- K Handout Set 1- Ten-frame Riddles
- Coherence Activity- What the Heck is a Rekenrek?
- K-5 Overview
- Fluency Activity (Ten-Frames, Dot Cards, Rekenrek)
- Deep Understanding Activity- K Handout Set 2- Old MacDonald's Barn
- Application Activity- Mathematizing Kindergarten
- Dual Intensity Activity- K Handout Set 3- Bo Peep's Domino Dilemma
- Suggestions and Resources

### **Six Lenses-**

Focus

Coherence

Fluency

Deep Understanding

Applications

Dual Intensity

## K-5 Overview

### Kindergarten

- Know number names and the count sequence.
- Count to tell the number of objects.
- Compare numbers.
- Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.
- Work with numbers 11–19 to gain foundations for place value.
- Describe and compare measurable attributes.
- Classify objects and count the number of objects in categories.
- Identify and describe shapes.
- Analyze, compare, create, and compose shapes.

### 1st Grade

- Represent and solve problems involving addition and subtraction.
- Understand and apply properties of operations and the relationship between addition and subtraction.
- Add and subtract within 20.
- Work with addition and subtraction equations.
- Extend the counting sequence.
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.
- Measure lengths indirectly and by iterating length units.
- Tell and write time.
- Represent and interpret data.
- Reason with shapes and their attributes.

### 2nd Grade

- Represent and solve problems involving addition and subtraction.
- Add and subtract within 20.
- Work with equal groups of objects to gain foundations for multiplication.
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.
- Measure and estimate lengths in standard units.
- Relate addition and subtraction to length.
- Work with time and money.
- Represent and interpret data.
- Reason with shapes and their attributes.

### 3rd Grade

- Represent and solve problems involving multiplication and division.
- Understand properties of multiplication and the relationship between multiplication and division.
- Multiply and divide within 100.
- Solve problems involving the four operations, and identify and explain patterns in arithmetic.
- Use place value understanding and properties of operations to perform multi-digit arithmetic.
- Develop understanding of fractions as numbers.
- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
- Represent and interpret data.
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.
- Reason with shapes and their attributes.

### 4th Grade

- Use the four operations with whole numbers to solve problems.
- Gain familiarity with factors and multiples.
- Generate and analyze patterns.
- Generalize place value understanding for multidigit whole numbers.
- Use place value understanding and properties of operations to perform multi-digit arithmetic.
- Extend understanding of fraction equivalence and ordering.
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- Understand decimal notation for fractions, and compare decimal fractions.
- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- Represent and interpret data.
- Geometric measurement: understand concepts of angle and measure angles.
- Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

### 5th Grade

- Write and interpret numerical expressions.
- Analyze patterns and relationships.
- Understand the place value system.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.
- Use equivalent fractions as a strategy to add and subtract fractions.

## GPB Kindergarten Session Resource Packet

- Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
- Convert like measurement units within a given measurement system.
- Represent and interpret data.
- Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
- Graph points on the coordinate plane to solve real-world and mathematical problems.
- Classify two-dimensional figures into categories based on their properties.

### Resources:

Teaching Guides/CCGPS: <https://www.georgiastandards.org/Pages/default.aspx>  
<https://portal.doe.k12.ga.us/Login.aspx>

Dot Cards and Ten Frames:

[http://www.edplus.canterbury.ac.nz/literacy\\_numeracy/maths/numdocuments/dot\\_card\\_and\\_ten\\_frame\\_package2005.pdf](http://www.edplus.canterbury.ac.nz/literacy_numeracy/maths/numdocuments/dot_card_and_ten_frame_package2005.pdf)

Rekenrek: [http://www.mathlearningcenter.org/media/Rekenrek\\_0308.pdf](http://www.mathlearningcenter.org/media/Rekenrek_0308.pdf)

GPB Kindergarten Handout Set 1

My ten-frame number is

My ten-frame number is

My ten-frame number is

My ten-frame number is


## 10 frame riddles

Choose a number between 0 and 10. Students can roll a number cube or grab counters from a bag of ten to determine number.

Draw that number of circles on your blank ten-frame.

Cover the ten-frame with an index card.

Write clues to describe the number of counters you drew on the ten-frame.

Use the word bank to help.

Try your riddle on a friend. Lift the index card to check.

### Word Bank for Ten-frame Riddles

same as            row

less than        full

more than       empty

odd                counters

even

equal to

Sample Riddle Clues:

My ten-frame has less than 10 counters.

My ten-frame has more than 2 counters.

My ten-frame has an odd number of counters.

My ten-frame has one more than 6 counters.

GPB Kindergarten Handout Set 2

**Constructing Task:** OLD FARMER MCDONALD

**STANDARDS ADDRESSED:**

**Practice Standards:**

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.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.



**Content Standards:**

***Understand addition as putting together and adding to, and understand subtractions as taking apart and taking from***

- K.OA.1. Represent addition and subtraction with objects, fingers, mental images, drawings<sup>1</sup>, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
- K.OA.2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
- K.OA.3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g.,  $5 = 2 + 3$  and  $5 = 4 + 1$ ).
- K.OA.4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
- K.OA.5. Fluently add and subtract within 5

*(Refer to grade level overview for unpacked standards )*

**BACKGROUND KNOWLEDGE:**

Students need to develop an understanding of part-whole relationships as they recognize that a set of objects (10) can be broken into smaller sub-sets (3 and 7) and still remain the total amount (10). In addition, this objective asks students to realize that a set of objects (10) can be broken in multiple ways (3 and 7; 4 and 6). Thus, when breaking apart a set (decompose), students use the understanding that a smaller set of objects exists within that larger set (inclusion).



The recording sheet for this task is optional because students need to learn to draw a representation of what they are thinking for three reasons:

*SMP2. Reason abstractly and quantitatively.*

*SMP3. Construct viable arguments and critique the reasoning of others.*

*SMP4. Model with mathematics.*

By encouraging students to organize their work and draw representations, students can begin to “talk through” their process. This enables students the opportunity to attend to precision as they explain and reason mathematically. Using tables, numbers, pictures and words allows students to become more efficient when identifying patterns in numbers and making generalizations.

Commutative property (flip flop) property might be identified during this task. Have students discuss whether or not to include commutative properties as possible combinations. There is no right or wrong answer, students should construct viable arguments and explain why their combination of animals is correct. In addition students must be willing to analyze and critique the reasoning of others. Although money is not explicitly described in the frameworks, coin recognition and value should be integrated whenever possible throughout the year.

### **ESSENTIAL QUESTIONS:**

- What happens when I decompose a quantity?
- How can I use different combinations of numbers to represent the same quantity?
- How can I represent problem situations using objects, pictures, and numbers?
- Why is it important that I can build the number combinations for the number 5?

### **MATERIALS:**

Recording Sheet

Accessible manipulatives

Pictures of barn animals or toy animals (not included)

**GROUPING:** whole/individual/small group task

### **TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION:**

It is useful to think of problem-based lessons as consisting of three main parts: *before, during, and after*. If you allot time for each part it is quite easy to devote a full period to one seemingly simple problem. (Van de Walle p.15-19)

The Before Phase: get students mentally prepared for the task, be sure the task is understood, and be certain that you have clearly established expectations beyond simply getting an answer.

The During Phase: the most important thing here is *let go!* Give students a chance to work without your guidance. Give them an opportunity to use *their* ideas and not simply follow directions. Your second task is to listen. Find out how different children or groups are thinking, what ideas they are using, and how they are approaching the problem. In this phase hints may be provided but not solutions and students should be encouraged to test ideas.

The After Phase: this is often where some of the best learning takes place. During the after phase students share emerging ideas and the community of class learners is developed. This will not develop quickly or easily and will be developed over time.

*(For a more detailed description of the three-phase problem-based learning model see Van de Walle Teaching Student-Centered Mathematics K-3 pp 15-19)*

**TASK:**

*Old Farmer McDonald needed put all of his animals into different barns each night. Each barn could have no more than 10 feet. What animals did Old McDonald put in his barn to equal ten feet? Find the different combinations of farm animals that equal 10 feet. Be sure to explain and justify your combinations.*

**FORMATIVE ASSESSMENT QUESTIONS:**

*Are there any more ways to decompose the number 5? How do you know?*

*Why did you decide to do it his way?*

*Are you sure that you have found them all? Why do you think so? How do you know?*

*Did you develop a shortcut to find your answers?*

*Did you identify any patterns or rules? Explain!*

**DIFFERENTIATION:**

**Extension**

**Intervention**

- Allow students to work through the stages at a speed that is appropriate for their abilities. Some students may need additional experiences acting out problems, using manipulatives, or drawing pictures. Students can use pictures of animals or toy animals from the block area and place them on the paper as they work through the task by physically acting it out. Start with a smaller number than 5 and allow students build and generalize the patterns that they are seeing

## Old Farmer McDonald



Old Farmer McDonald needed put all of his animals into different barns each night. Each barn could have no more than 10 feet. What animals did Old McDonald put in his barn to equal ten feet? Find the different combinations of farm animals that equal 10 feet. Be sure to explain and justify your combinations.



**Constructing Task:** BO PEEPS DOMINO DILEMMA

**STANDARDS ADDRESSED:**

**Practice Standards:**

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.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

**Content Standards Addressed in this Task:**

***Understand addition as putting together and adding to, and understand subtractions as taking apart and taking from***

- K.OA.1. Represent addition and subtraction with objects, fingers, mental images, drawings<sup>1</sup>, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
- K.OA.2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
- K.OA.3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g.,  $5 = 2 + 3$  and  $5 = 4 + 1$ ).
- K.OA.4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
- K.OA.5. Fluently add and subtract within 5

*(Refer to grade level overview for unpacked standards )*

**BACKGROUND KNOWLEDGE:**

Students need to develop an understanding of part-whole relationships as they recognize

that a set of objects (5) can be broken into smaller sub-sets (3 and 2) and still remain the

total amount (5). In addition, this objective asks students to realize that a set of objects

(5) can be broken in multiple ways (3 and 2; 4 and 1). Thus, when breaking apart a set (decompose), students use the understanding that a smaller set of objects exists within that larger set (inclusion).

The recording sheet for this task is optional because students need to learn to draw a representation of what they are thinking for three reasons:

*SMP2. Reason abstractly and quantitatively.*

*SMP3. Construct viable arguments and critique the reasoning of others.*  
*SMP4. Model with mathematics.*

By encouraging students to organize their work and draw representations, students can begin to “talk through” their process. This enables students the opportunity to attend to precision as they explain and reason mathematically. Using tables, numbers, pictures and words allows students to become more efficient when identifying patterns in numbers and making generalizations.

Commutative property (flip flop) property might be identified during this task. Have students discuss whether or not to include commutative properties as possible combinations. There is no right or wrong answer, students should construct viable arguments and explain why their combination of pips is correct. In addition students must be willing to analyze and critique the reasoning of others. Although money is not explicitly described in the frameworks, coin recognition and value should be integrated whenever possible throughout the year.

**ESSENTIAL QUESTIONS:**

- What happens when I decompose a quantity?
- How can I use different combinations of numbers to represent the same quantity?
- How can I represent problem situations using objects, pictures, and numbers?
- Why is it important that I can build the number combinations for the number 5?

**MATERIALS:**

Recording sheet (optional)  
Accessible manipulatives or dominos

**GROUPING:** whole/individual/small group task

**TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION:**

If students have never been introduced to the game of domino allow students to explore and play a couple of games before the task begins. Have students discuss the strategies they used during the game. Introduce students to the task of 5 pips or 10 pips. Begin by discussing the vocabulary in the task and check for understanding.

**TASK 1:**

*Little Bo Peep loved to play dominoes. She had one domino in her pocket. The sum of the pips on her domino was 5. What could the domino in Bo Peeps Pocket look like?*

**TASK 2:**

*Little Bo Peep loved to play dominoes. One day she had 2 dominoes in her pocket and the sum of the pips on her two dominos was 10. What could have been the two dominoes in Bo Peeps Pocket?*

**FORMATIVE ASSESSMENT QUESTIONS:**

*Are there any more ways to decompose the number 5? How do you know?*

*Why did you decide to do it his way?*

*Are you sure that you have found them all? Why do you think so? How do you know?*

*Did you develop a shortcut to find your answers?*

*Did you identify any patterns or rules? Explain!*

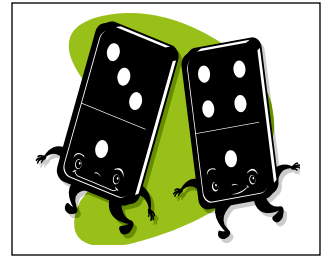
**DIFFERENTIATION:**

**Extension**

Have the students identify which number of pips is the most frequent amongst the dominos. Have students make a conjecture (draw a conclusion) explaining why the number is most frequent.

**Intervention**

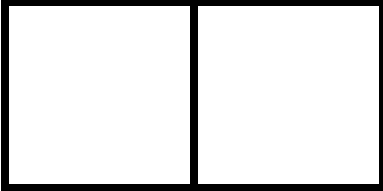
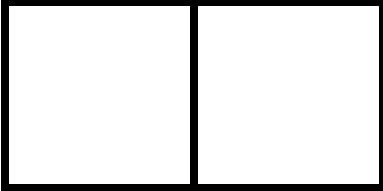
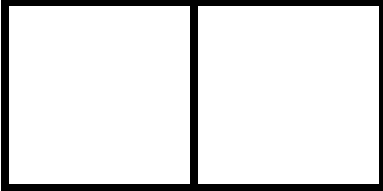
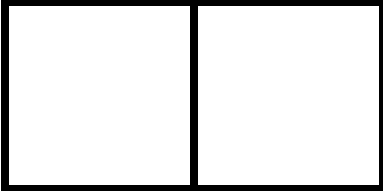
Use a blank domino mat or folded piece of paper and give the student 5 or 10 counters and have them create the domino. Then the domino is transferred to the recording sheet.

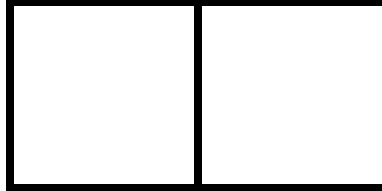
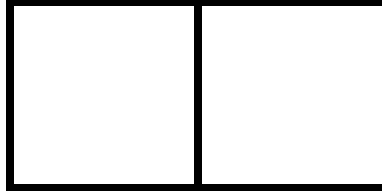
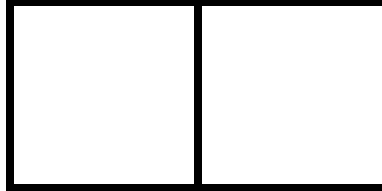
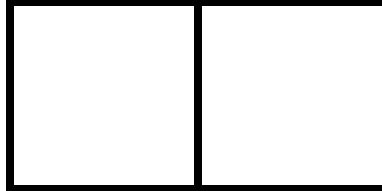


## Bo Peep's Domino Dilemma

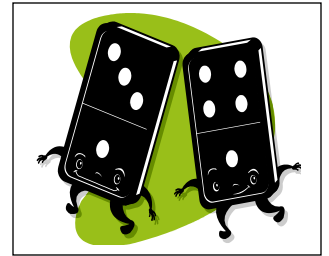
Little Bo Peep loved to play dominoes. One day She had a domino in her pocket and the sum of the pips on her domino was 5. What could the domino in Bo Peeps Pocket look like?

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## Bo Peep's Domino Dilemma

Little Bo Peep loved to play dominoes. One day, she had 2 dominoes in her pocket and the sum of the pips on her two dominos was 10. What could have been the two dominoes in Bo Peeps Pocket?

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Session Notes: