

**SHOW ME 6 on the top  
row of the MathRack.  
How many more to 10?  
How do you know?**

**Repeat with 6-9**

# MathRack



## ACTIVITY CARDS

**At Mary's birthday party  
there were 3 kids on the top  
bunk of her bunk bed.  
There were also 4 kids on  
the lower bunk. How many  
kids were on the bunk bed?**

**3 on top    3 on bottom**

**4 on top    2 on bottom**

**5 on top    1 on bottom**

**6 on top    0 on bottom**

**How many beads do you see?  
Describe how you know the  
total.**

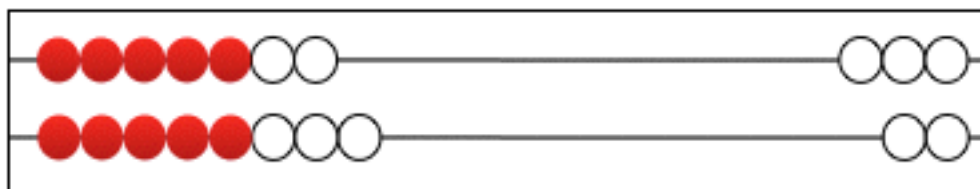
# MathRack Task Cards

## Purpose:

To use the MathRack in conjunction with early number sense 'tasks' to develop understanding of number sense through Quick Images, Show Me activities, Number Strings, and Situational Problem Solving.

## How to use the MathRack:

The start position for the MathRack is 'white to right'. All the beads to the right. The beads 'in play' are moved to the left.



This example shows  $7 + 8$

# QUICK IMAGES

## Rationale:

Children will recognize and name how many objects are in a small group without counting. (subitizing) The different colors and embedded five structure of the MathRack helps children build mental images of numbers.

The activity emphasizes cardinality (how many), spatial relationships, and overall number sense.

## Directions:

Briefly display an arrangement of beads and then cover it up to give children time to think about it. Then ask them to tell a partner how many they saw and why they think that number is correct. Show the images long enough to allow children to see the beads and groups of five but not long enough for them to count beads individually. This time constraint encourages children who are counting each bead to shift strategies that are more efficient.

## Differentiation:

The cards consist of images less than 5, then 3-6 on one row of the MathRack, then 7-9 on two rows, and then place value of numbers 20-100.

These are just examples of what can be shown during quick images, you can do the same routine but create different quick images using your MathRack.

# SHOW ME

## Rationale:

Children will develop an understanding of the meanings of whole numbers and recognize the number of objects in small groups without counting and by counting. They will understand the relationships between numbers and quantities, connect counting to cardinality. Children will relate counting to addition and subtraction and develop an understanding of spatial, benchmarks of 5 and 10, 1 and 2 more or less, and part - part whole relationships.

## Directions:

Give each child a MathRack. You will need a set of dot patterns, ten frame cards or display the amount you want them to show using your fingers. Separate the dot pattern and/or ten frame cards into piles showing numbers 1-5 and 5-10. You will flash a dot pattern, ten frame cards or fingers and the children will re-create that number using their MathRack. Show the card for around 5 seconds, then hide it, and watch how children are showing that number using their MathRack. Discuss how they determined the number on the card and then how they showed that number on their MathRack.

## Differentiation:

The cards consist of quantities of 1-5, 6-10, then 2-5 in different ways, then 6-10 in different ways. The activities also emphasize one / two more or less, part - part - whole, doubles, and benchmarks of 5 and 10.

You can create your own Show Me activities based on these relationships by changing the numbers given on the cards.

# NUMBER STRINGS

## Rationale:

A number string is a set of related math problems to emphasize relationships. The benefits of the strings are everlasting. Students work to solve strings using mental math strategies and then share their strategy with the class after being give time to sit and think about the problem.

## Directions:

The teacher will display the three to four series of the number string on separate MathRacks. The children can work in groups of 3-4 and duplicate the series with their MathRacks and discuss the relationship of the string. How many beads do you see? How do you see them? Then the entire group will meet to discuss their findings and the relationship that was emphasized.

## Differentiation:

The cards were created to emphasize part-part whole relationships for numbers 5-10, one/two more & less, doubles, compensation and equivalence (like how  $6+4=5+5$ ), and the commutative property ( $3+4 = 4+3$ ).

You can create your own number strings based upon these relationships by changing the numbers given on the cards.

# SITUATION PROBLEM SOLVING

## Rationale:

Children will use addition and subtraction within 20 to solve word problems involving situations of joining, separating, putting together, and comparing with unknowns in all positions. It is important to connect math to context to deepen students' understanding. Children should use the MathRack as a model for the problem given in context, be able to draw a representation on paper or a number path, and then write the number sentence for the problem. As children become comfortable with the MathRack and doing all three things each time they do an activity it will enhance their understanding and ensure that the tool does not become a crutch. The MathRack is a tool with a built-in structure that encourages students to develop mental maps of numbers 1-20. Once that is developed the tool should be taken away.

## Directions:

Read the card and move the beads on the MathRack to model the situation. Once the beads are moved discuss the solution and ask children to justify their answer. You may also want to extend the conversation to 'How do you know?' and/or 'What do you see?' ie.  $7 + 8$  may be seen as  $7 + 7 + 1$ ,  $8 + 8 - 1$ ,  $5 + 5 + 5$  etc.

By teaching math using a context children can connect with is essential to their understanding. We have chosen bunk beds and a double decker bus as scenarios to demonstrate common addition and subtraction situations using the MathRack. The top row of beads being the upper bunk and the bottom row the lower bunk. The top row of beads will also represent passengers on the upper and lower deck. Try using two tier bookshelves, two level house etc as the context. (Context for Learning Math-Fosnot)

## Differentiation:

The cards consist of word problems involving 12 different situations. To differentiate, change the numbers within the problems to correlate with the student's level of understanding.

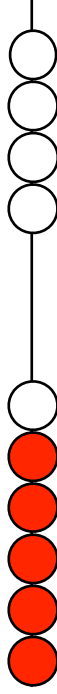
QI-1



QI-2



QI-3



QI-4



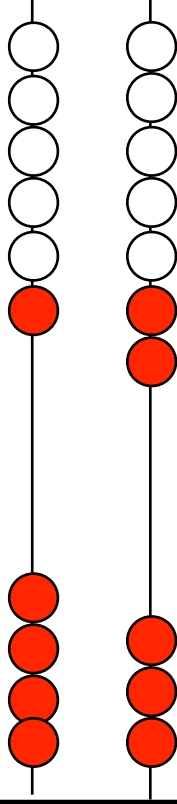
Q1-5



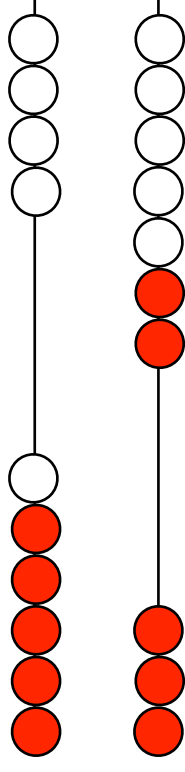
Q1-6



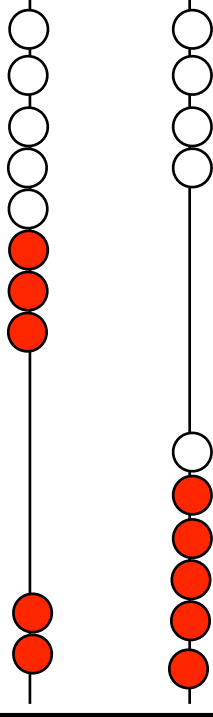
Q1-7



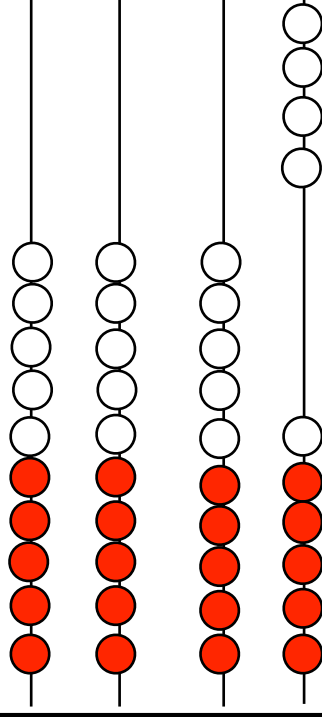
Q1-8



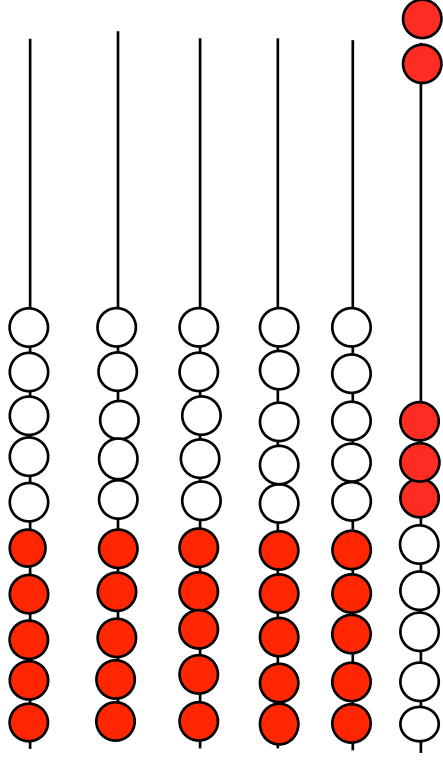
QI-9



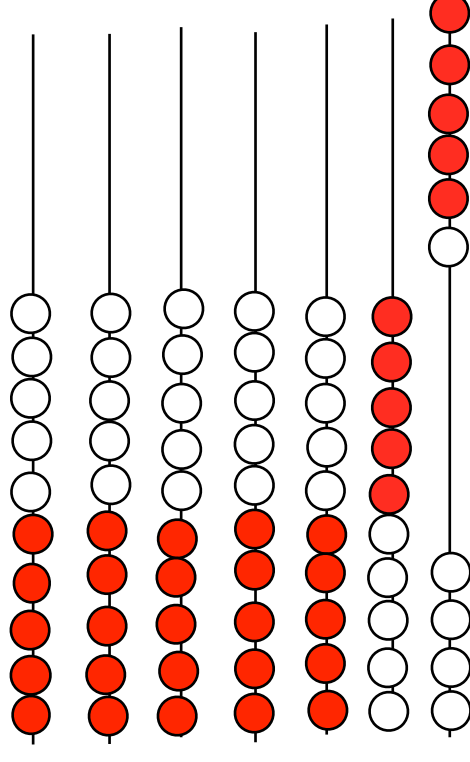
QI-10



QI-11



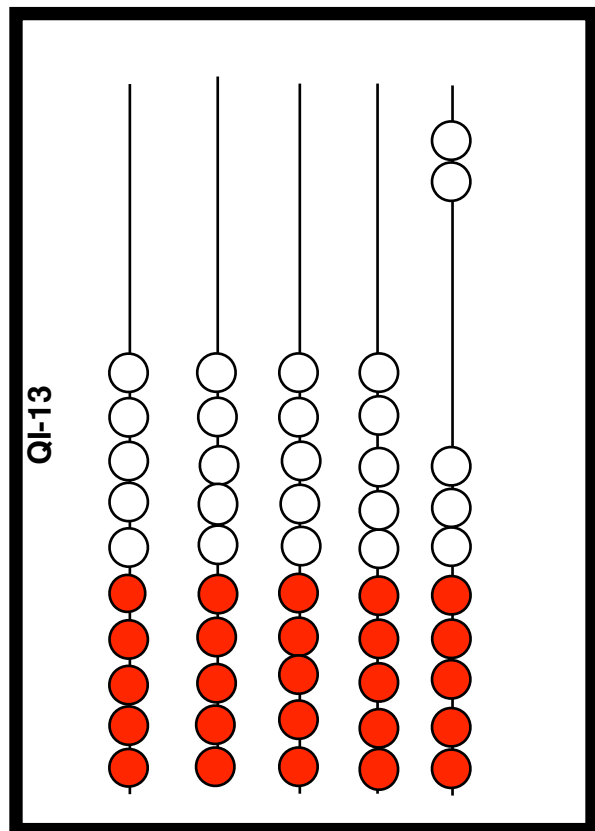
QI-12



## Quick Image

### MathRack Images

Briefly display an arrangement of beads and then cover it up to give children time to think about it. Then ask them to tell a partner how many they saw and why they think that number is correct. Show the images long enough to allow children to see the beads and groups of five but not long enough for them to count beads individually. This time constraint encourages children who are counting each bead to shift strategies that are more efficient.



## Show Me

### SM= Show Me

Give each child a MathRack. You will need a set of dot patterns, ten frame cards, or display the amount you want them to show using your fingers. Separate the dot pattern and/or ten frame cards into piles showing numbers 1-5 and 5-10. You will flash a dot pattern etc and the children will recreate that number using their MathRack. Show the card for around 5 sec. then hide it, and watch how children are showing the number using their MathRack. Discuss how they determined the number on the card and then how they showed that number on their MathRack. Focus on numbers 1-5 first is recommended.

## SM-1

**I SHOW 3 with my fingers, ten frame, or a dot pattern. You SHOW ME 3 on the MathRack.**

**Repeat with numbers 1-5**

[mathrack.com](http://mathrack.com)

### **SM-2**

**I SHOW 6 with my fingers, ten frame, or dot cards. You SHOW ME 6 on the MathRack.**

**Repeat with numbers 6-10**

[mathrack.com](http://mathrack.com)

### **SM-3**

**SHOW ME 5 on the MathRack. Show me 5 a different way using two rows. How do you know?**

**Repeat with numbers 2-5**

[mathrack.com](http://mathrack.com)

### **SM-4**

**SHOW ME 6 on the MathRack. Show me 6 a different way using two rows. How do you know?**

**Repeat with numbers 6-10**

[mathrack.com](http://mathrack.com)

### **SM-5**

**SHOW ME 2 on the MathRack. SHOW ME one more. How many are there now on the MathRack? How do you know?**

**Repeat with numbers 1-5**

[mathrack.com](http://mathrack.com)

### SM-6

**SHOW ME 6 on the MathRack. SHOW ME one more. How many are there now on the MathRack? How do you know? Repeat with numbers 6-10**

[mathrack.com](http://mathrack.com)

### SM-7

**SHOW ME 2 on the MathRack. SHOW ME one less than that. How many are there now on the MathRack? How do you know?**

**Repeat with numbers 2-5**

[mathrack.com](http://mathrack.com)

### SM-8

**SHOW ME 6 on the MathRack. SHOW ME one less than that. How many are there now on the MathRack? How do you know?**

**Repeat with numbers 6-10**

[mathrack.com](http://mathrack.com)

### SM-9

**SHOW ME 3 on the MathRack. How many more do I need to make 5? How do you know?**

**Repeat with numbers 1-5 to make 5**

[mathrack.com](http://mathrack.com)

### **SM-10**

**SHOW ME 1 on the MathRack. How many more do I need to make 10. How do you know?**

**Repeat with numbers 1-10**

[mathrack.com](http://mathrack.com)

### **SM-11**

**SHOW ME 1 on the top row and 1 on the bottom row of the MathRack. How many are there all together?**

**Repeat with the doubles 1-10**

[mathrack.com](http://mathrack.com)

### **SM-12**

**SHOW ME 3 on the top row. How many more/less to 5? How do you know?**

**Repeat with numbers 3-7**

[mathrack.com](http://mathrack.com)

### **SM-13**

**SHOW ME 6 on the top row of the MathRack. How many more to 10? How do you know?**

**Repeat with 6-9**

[mathrack.com](http://mathrack.com)

## Number Strings

**NS = Number Strings**

The teacher will display three to four series of the number string on separate MathRacks. The students can discuss the relationship of the string. OR The children can work in groups of 3-4 and duplicate the series with their MathRacks and discuss the relationship of the string. How many beads do you see? How do you see them? Then the entire group will meet to discuss their findings and the relationship that was emphasized.

## NS-1

2 on top    2 on bottom

2 on top    3 on bottom

1 on top    4 on bottom

0 on top    5 on bottom

How many beads do you see?  
Describe how you know the  
total.

[mathrack.com](http://mathrack.com)

## NS-2

3 on top    3 on bottom

4 on top    2 on bottom

5 on top    1 on bottom

6 on top    0 on bottom

How many beads do you see?  
Describe how you know the  
total.

[mathrack.com](http://mathrack.com)

## NS-3

3 on top    3 on bottom

3 on top    4 on bottom

4 on top    3 on bottom

5 on top    2 on bottom

How many beads do you see?  
Describe how you know the  
total.

[mathrack.com](http://mathrack.com)

### NS-4

4 on top 4 on bottom

3 on top 5 on bottom

2 on top 6 on bottom

6 on top 2 on bottom

How many beads do you see?  
Describe how you know the  
total.

[mathrack.com](http://mathrack.com)

### NS-5

5 on top 5 on bottom

5 on top 4 on bottom

6 on top 3 on bottom

7 on top 2 on bottom

How many beads do you see?  
Describe how you know the  
total.

[mathrack.com](http://mathrack.com)

### NS-6

5 on top 5 on bottom

4 on top 6 on bottom

7 on top 3 on bottom

2 on top 8 on bottom

How many beads do you see?  
Describe how you know the  
total.

[mathrack.com](http://mathrack.com)

### NS-7

7 on top 7 on bottom

8 on top 7 on bottom

7 on top 6 on bottom

8 on top 8 on bottom

How many beads do you see?  
Describe how you know the  
total .

[mathrack.com](http://mathrack.com)

### NS-8

6 on top    6 on bottom

7 on top    6 on bottom

6 on top    5 on bottom

5 on top    5 on bottom

How many beads do you see?  
Describe how you know the  
total.

[mathrack.com](http://mathrack.com)

### NS-9

10 on top    8 on bottom

8 on top    10 on bottom

9 on top    9 on bottom

How many beads do you see?  
Describe how you know the  
total.

[mathrack.com](http://mathrack.com)

### NS-10

5 on top    8 on bottom

6 on top    7 on bottom

7 on top    6 on bottom

How many beads do you see?  
Describe how you know the  
total.

[mathrack.com](http://mathrack.com)

### NS-11

6 on top    3 on bottom

3 on top    6 on bottom

5 on top    8 on bottom

8 on top    5 on bottom

How many beads do you see?  
Describe how you know the  
total.

[mathrack.com](http://mathrack.com)

## NS-12

7 on top    3 on bottom

3 on top    7 on bottom

4 on top    2 on bottom

2 on top    4 on bottom

How many beads do you see?  
Describe how you know the  
total.

[mathrack.com](http://mathrack.com)

## Situation Problem Solving

PS=Problem Solving

Read the card and move the beads on the MathRack to model the situation and provide a visual for the student. Once the beads are moved discuss the solution and ask children to justify their answer. You may also want to extend the conversation to 'How do you know?' and/or 'What do you see?' i.e.  $7 + 8$  may be seen as  $7 + 7 + 1$ ,  $8 + 8 - 1$ ,  $5 + 5 + 5$  etc

## PS-1

At Mary's birthday party there were 3 kids on the top bunk of her bunk bed. There were also 4 kids on the lower bunk. How many kids were on the bunk bed?

[mathrack.com](http://mathrack.com)

## PS-2

At Jill's slumber party there were 6 kids on the bunk bed. Some more kids got on and now there are 9 kids on the bunk bed. How many kids got on the bunk bed?

[mathrack.com](http://mathrack.com)

### PS-3

Some of Tom's cousins were on his bunk bed. 4 more cousins got on the bunk bed and now there are 8 cousins on the bunk bed. How many cousins were on the bed before?

[mathrack.com](http://mathrack.com)

### PS-4

7 neighbor kids were on Cathy's bunk bed. 3 kids jump off. How many kids are on the bunk bed?

[mathrack.com](http://mathrack.com)

### PS-5

There are 10 friends on the bunk bed. Some of them got off the bed and now there are 7 friends on the bunk bed. How many friends got off the bunk bed?

[mathrack.com](http://mathrack.com)

### PS-6

In the city there are double decker buses. There are 10 seats on the upper deck and 10 seats on the lower deck. If there are 2 passengers on the upper deck and 4 on the bottom, how many passengers are on the bus?

[mathrack.com](http://mathrack.com)

### PS-7

In the city there are double decker buses. There are 10 seats on the upper deck and 10 seats on the lower deck. If there are 7 passengers on the upper deck. At the next stop, 8 more passengers got on the bus. How many passengers are on the bus now?

[mathrack.com](http://mathrack.com)

### PS-8

9 people are on the double decker bus. 4 people are on the upper deck and the rest are on the lower deck. How many are on the lower deck?

[mathrack.com](http://mathrack.com)

### PS-9

There are 5 adults on the bus. How many can sit on the top deck and how many can sit on the lower deck?

[mathrack.com](http://mathrack.com)

### PS-10

There are 9 passengers on the upper deck and 6 on the lower deck. How many more passengers are on the upper deck?

\*How many fewer are on the lower deck?

[mathrack.com](http://mathrack.com)

### PS-11

There are 4 more people on the upper deck than the lower deck. The lower deck has 5 people. How many people are on the upper deck?

\*The lower deck has 4 fewer people than the upper deck. The lower deck has 5 people. How many people are on the upper deck?

[mathrack.com](http://mathrack.com)

### PS-12

The upper deck has 2 more people than the lower deck. The upper deck has 8 people. How many people are on the lower deck?

\*The lower deck has 2 fewer people than the upper deck. The upper deck has 8 people. How many people are on the lower deck?

[mathrack.com](http://mathrack.com)

### PS-13

There were some passengers on the bus but the bus driver forgot to count them. At the next stop, 6 more passengers got on the bus. Now there are 14 passengers. How many passengers were on the bus before that stop?

[mathrack.com](http://mathrack.com)

### NS-13

7 on top    3 on bottom

3 on top    7 on bottom

4 on top    2 on bottom

2 on top    4 on bottom

How many beads do you see?  
Describe how you know the total.

[mathrack.com](http://mathrack.com)