Core Knowledge® MATHEMATICS

Composing and Decomposing Numbers to 10

Student Workbook

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Composing and Decomposing Numbers to 10

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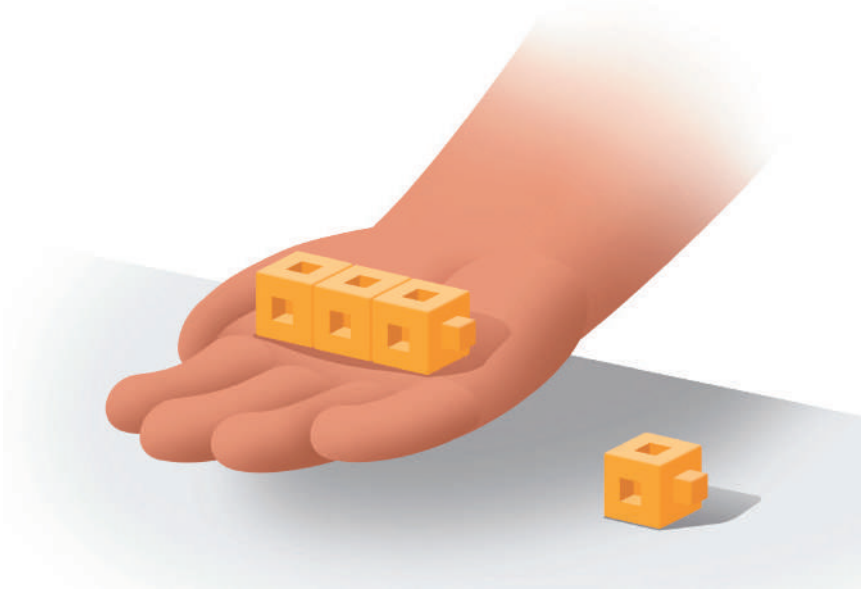


Composing and Decomposing Numbers to 10

Student Workbook

Core Knowledge Mathematics™

Lesson 1: Make 2 Parts

- Let’s break numbers up into parts.

Warm-up: Notice and Wonder: 2 Pictures

What do you notice?
What do you wonder?

1.2: Diego's and Lin's Connecting Cubes

Diego's cubes

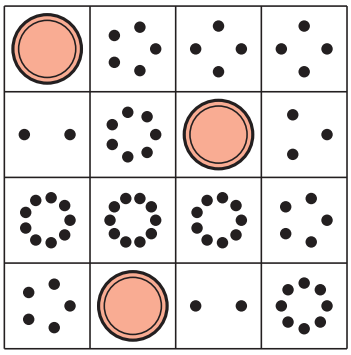
Lin's cubes

1.3: Introduce Check It Off, Add Within 10

Choose a center.

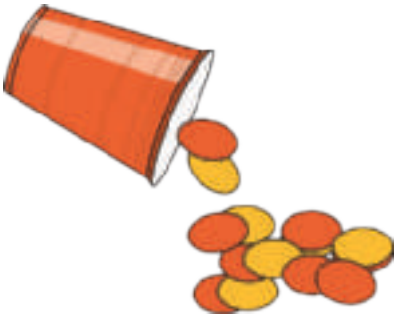
Check it Off

Bingo



Find the Value of Expressions

Shake and Spill



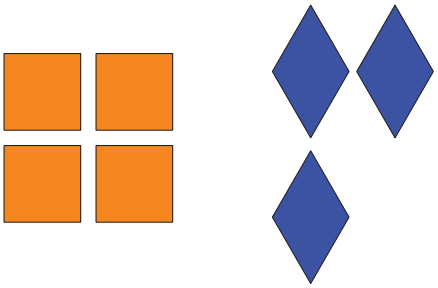
Lesson 2: Make and Break Apart Pattern Block Designs

- Let's make and break apart pattern block designs.

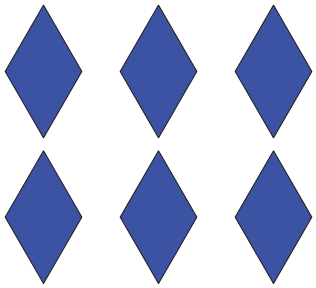
Warm-up: Which One Doesn't Belong: Pattern Block Designs

Which one doesn't belong?

A



B



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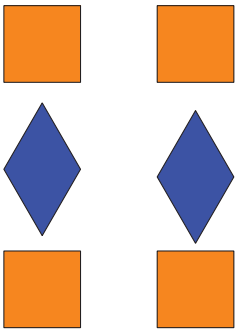

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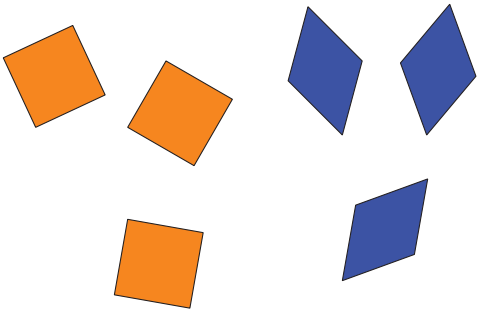
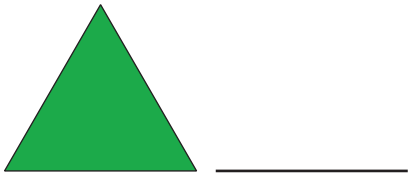
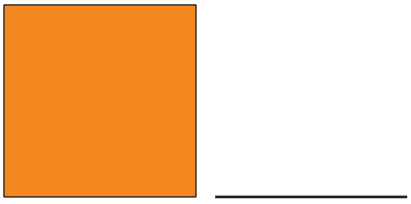


2.1: Create Pattern Blocks Designs

My Design

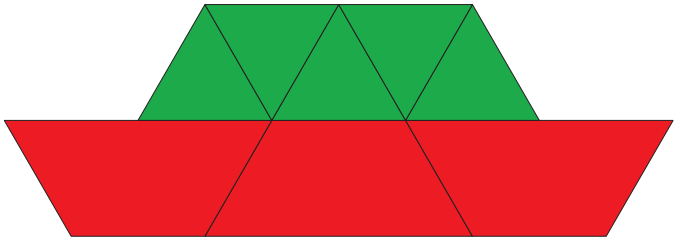




2.2: Han's Pattern Block Design

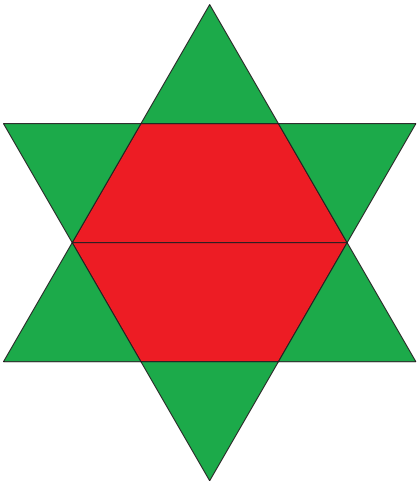
Han used 8 pattern blocks.

1.



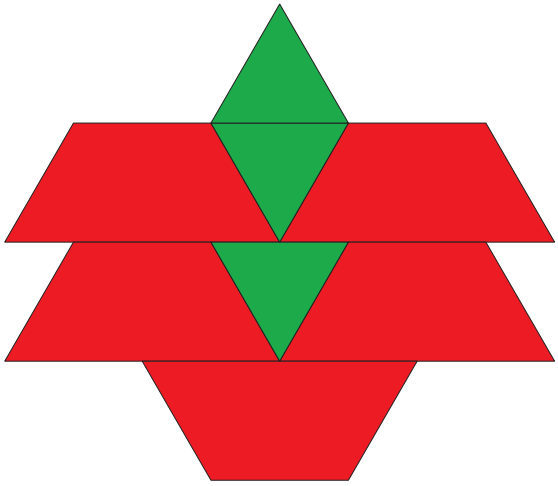
Expression: _____

2.



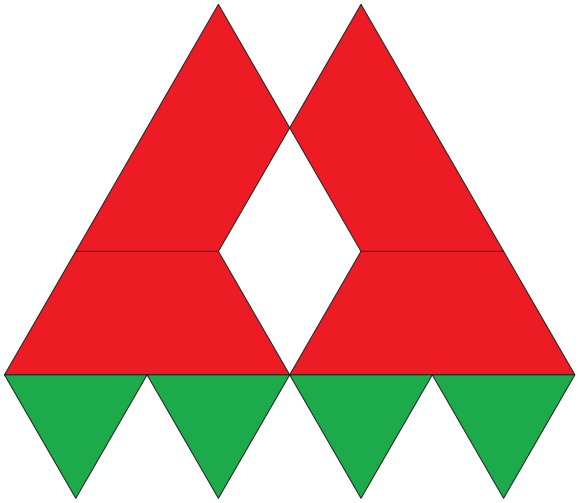
Expression: _____

3.



Expression: _____

4.



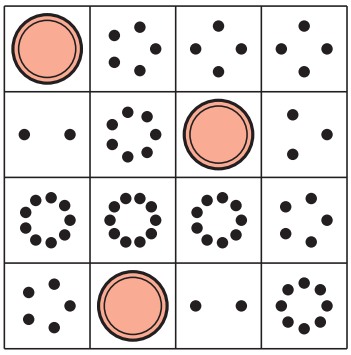
Expression: _____

2.3: Centers: Choice Time

Choose a center.

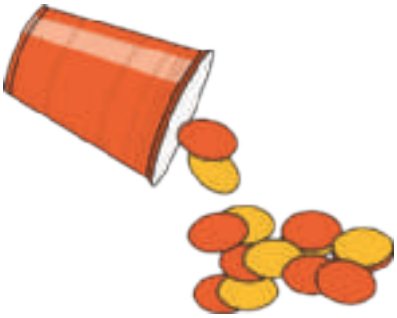
Check it Off

Bingo



Find the Value of Expressions

Shake and Spill

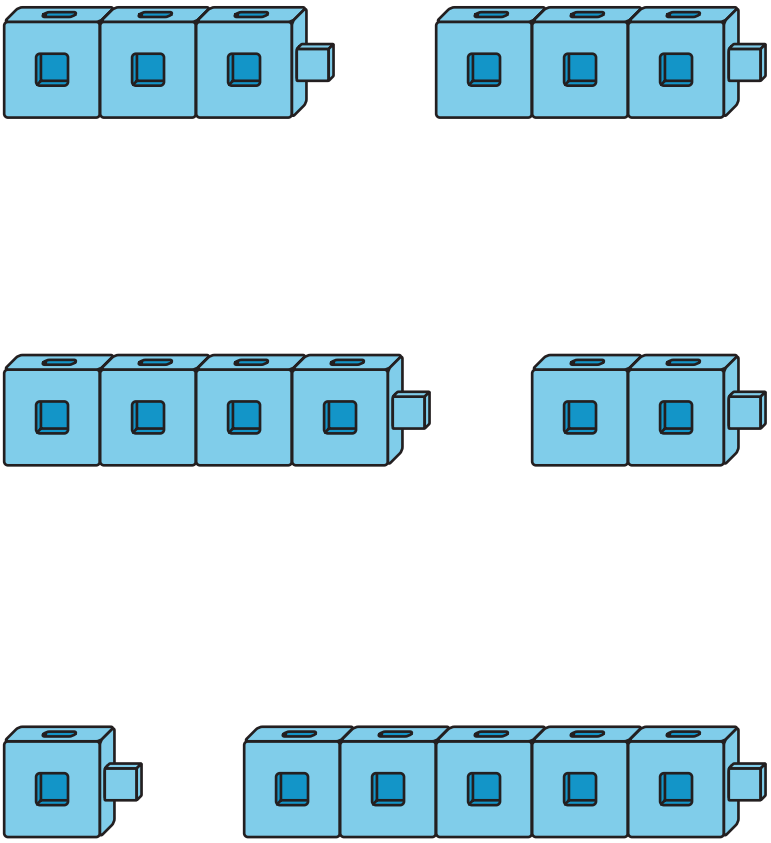


Lesson 3: Snap the Cubes

- Let's find different ways to break apart numbers.

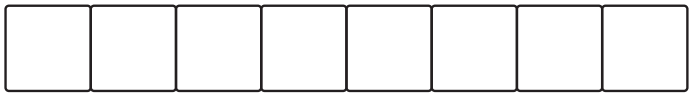
Warm-up: Notice and Wonder: Connecting Cube Towers

What do you notice?
What do you wonder?

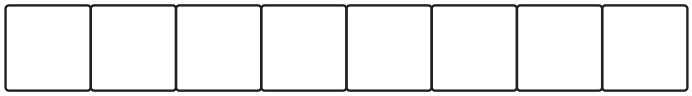


3.1: Introduce What's Behind My Back, Show 2 Parts

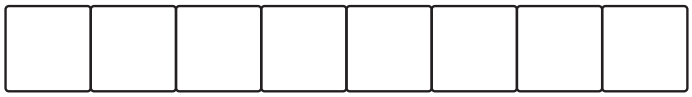
8 cubes



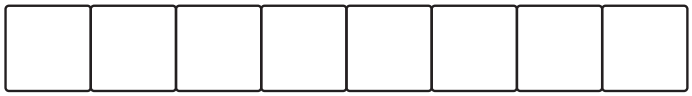
expression: _____



expression: _____

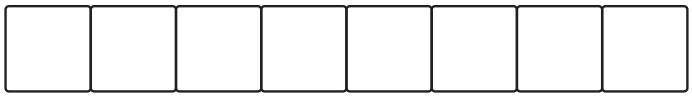


expression: _____

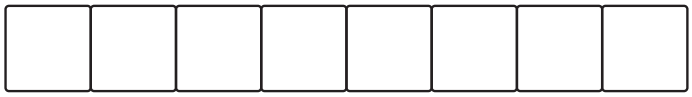


expression: _____

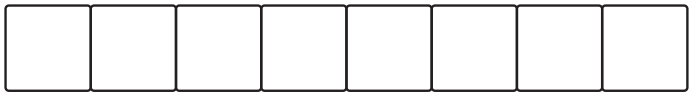
8 cubes



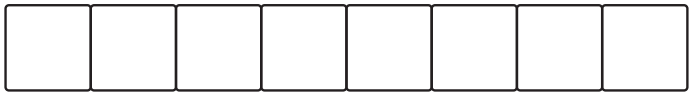
expression: _____



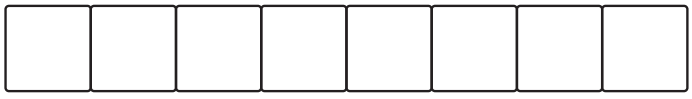
expression: _____



expression: _____



expression: _____



expression: _____

3.2: More Than One Way

4
9
6

7
5
8

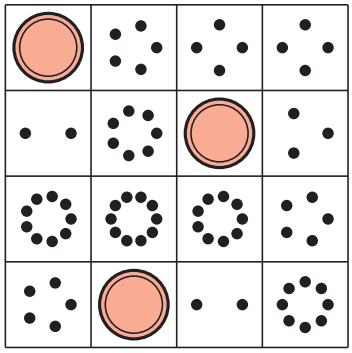
3.3: Centers: Choice Time

Choose a center.

What's Behind My Back?

Check it Off

Bingo

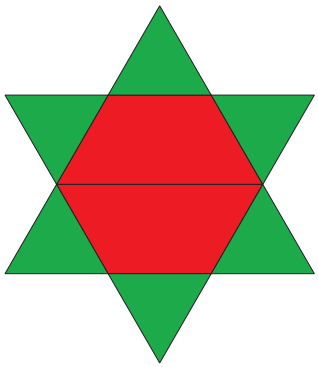


Find the Value of Expressions

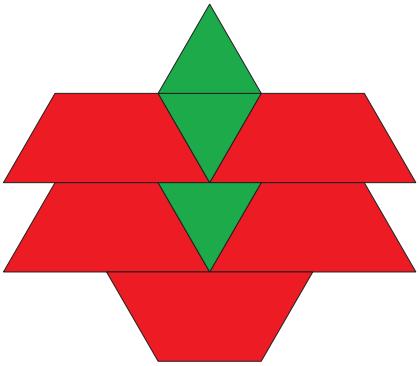
Shake and Spill

Section Summary

Section Summary
In this section, we used objects to make and break apart numbers in different ways.

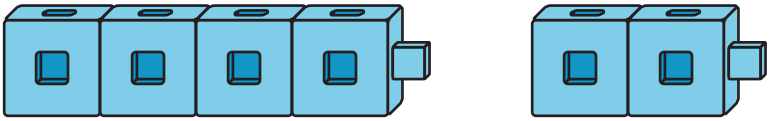


There are 8 pattern blocks.
There are 2 red trapezoids and 6 green triangles.

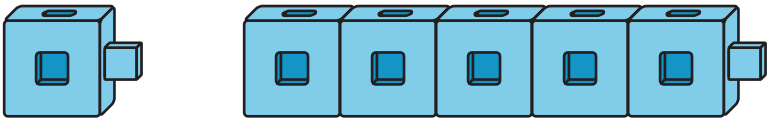


There are 8 pattern blocks.
There are 3 green triangles and 5 red trapezoids.

We wrote expressions to show different ways to make and break apart numbers.



There are 6 connecting cubes.
6 is $4 + 2$.

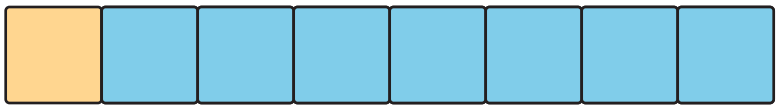


There are 6 connecting cubes.
6 is $1 + 5$.

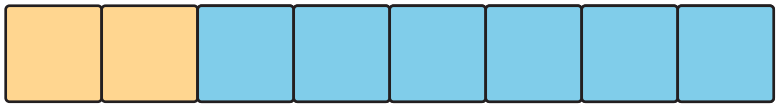
Lesson 4: Find All the Ways

- Let’s find all the ways to break apart a number.

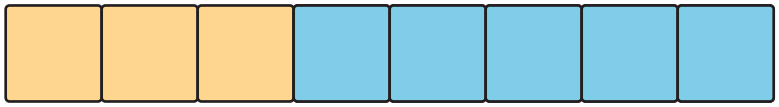
4.1: Patterns in Decompositions



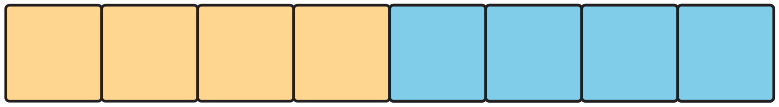
expression: _____



expression: _____



expression: _____



expression: _____

expression: _____

expression: _____

4.2: Find All the Ways

Find all the different ways you can break apart 7 into 2 parts.

Show your thinking using objects, drawings, numbers, or words.

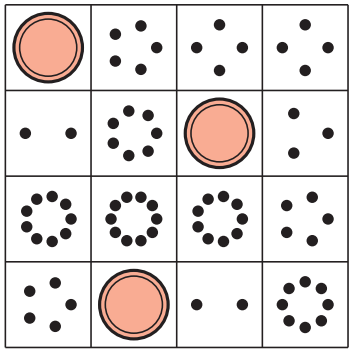
4.3: Centers: Choice Time

Choose a center.

What's Behind My Back?

Check it Off

Bingo



Find the Value of Expressions

Shake and Spill

Lesson 5: Put Together

- Let's show what happens in a story problem and solve it.

Warm-up: Notice and Wonder: Numberless Story Problem

What do you notice?
What do you wonder?

Elena was shopping at the market with her grandfather.

Elena chose some mangoes.

Her grandfather chose some pineapples.

How many pieces of fruit did they choose?

5.1: Fruit at the Market

Elena was shopping at the market with her grandfather.

Elena chose 4 mangoes.

Her grandfather chose 2 pineapples.

How many pieces of fruit did they choose?

5.2: A Bear with Berries

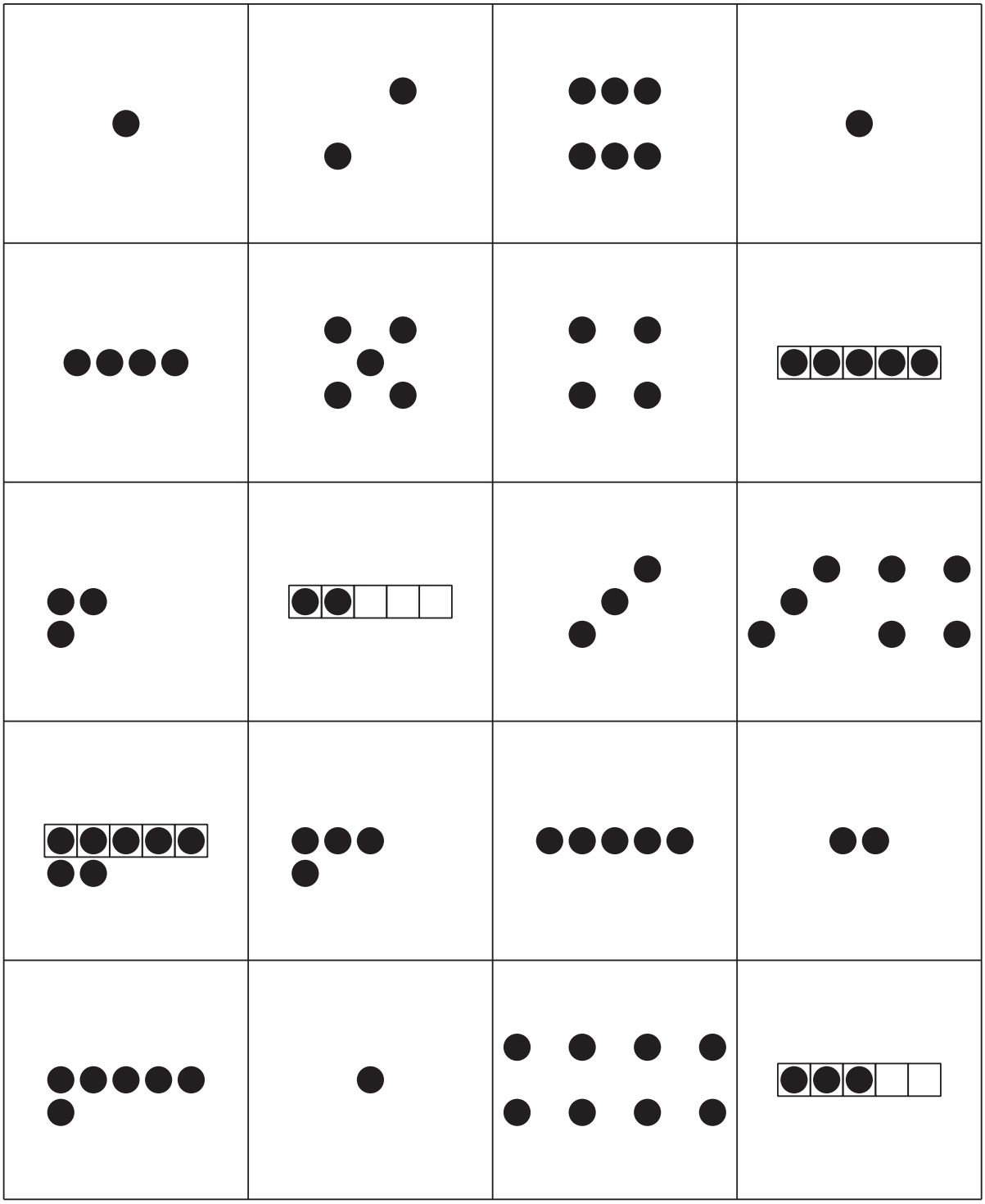
A bear was searching for berries to eat in the forest.

He ate 3 blueberries.

He ate 6 raspberries.

How many berries did the bear eat?

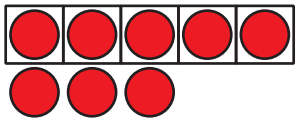
5.3: Introduce Make or Break Apart Numbers, Numbers to 9



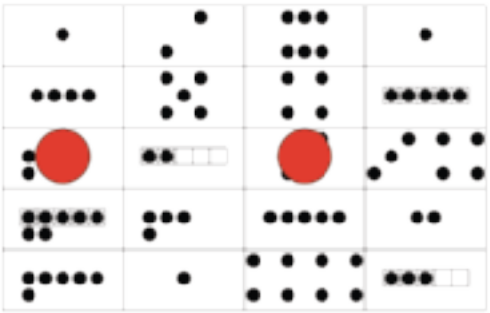
Choose a center.

What's Behind My Back?

5-frames



Make or Break Apart Numbers



Lesson 6: Red and Yellow Apples

- Let’s show what happens in a story.

Warm-up: Act It Out: All About Apples

Mai was picking apples at the orchard.

Mai picked 5 yellow apples and 2 red apples.

6.1: Two Problems about Apples

1. Mai was picking apples at the orchard.

   Mai picked 5 yellow apples and 2 red apples.

2. Lin picked 8 apples at the orchard.

   Some of the apples were yellow.

   The rest of the apples were red.

6.2: Yellow Apples and Red Apples

Lin picked 8 apples at the orchard.

Some of the apples were yellow.

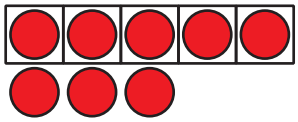
The rest of the apples were red.

6.3: Centers: Choice Time

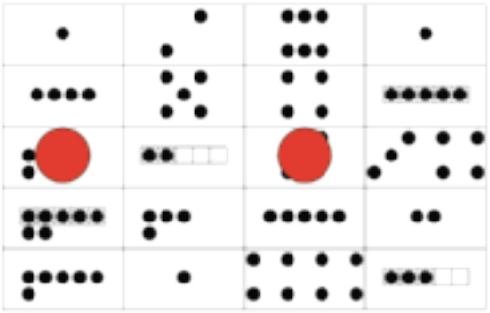
Choose a center.

What's Behind My Back?

5-frames



Make or Break Apart Numbers



Lesson 7: Solve Both Addends Unknown Story Problems

- Let's solve story problems.

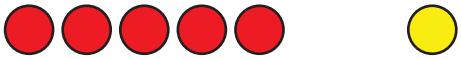
Warm-up: Which One Doesn't Belong: Decompose with Math Tools

Which one doesn't belong?

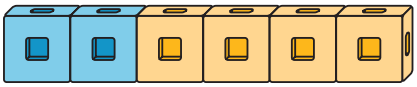
A

B

C



D



7.1: Fruit for Paletas

Jada made 6 paletas with her brother.

They made two flavors, lime and coconut.

How many of the paletas were lime?

Then how many of the paletas were coconut?

7.2: Pomegranates

Kiran had 7 pomegranates in his bag.

He put some of the pomegranates on the shelf.

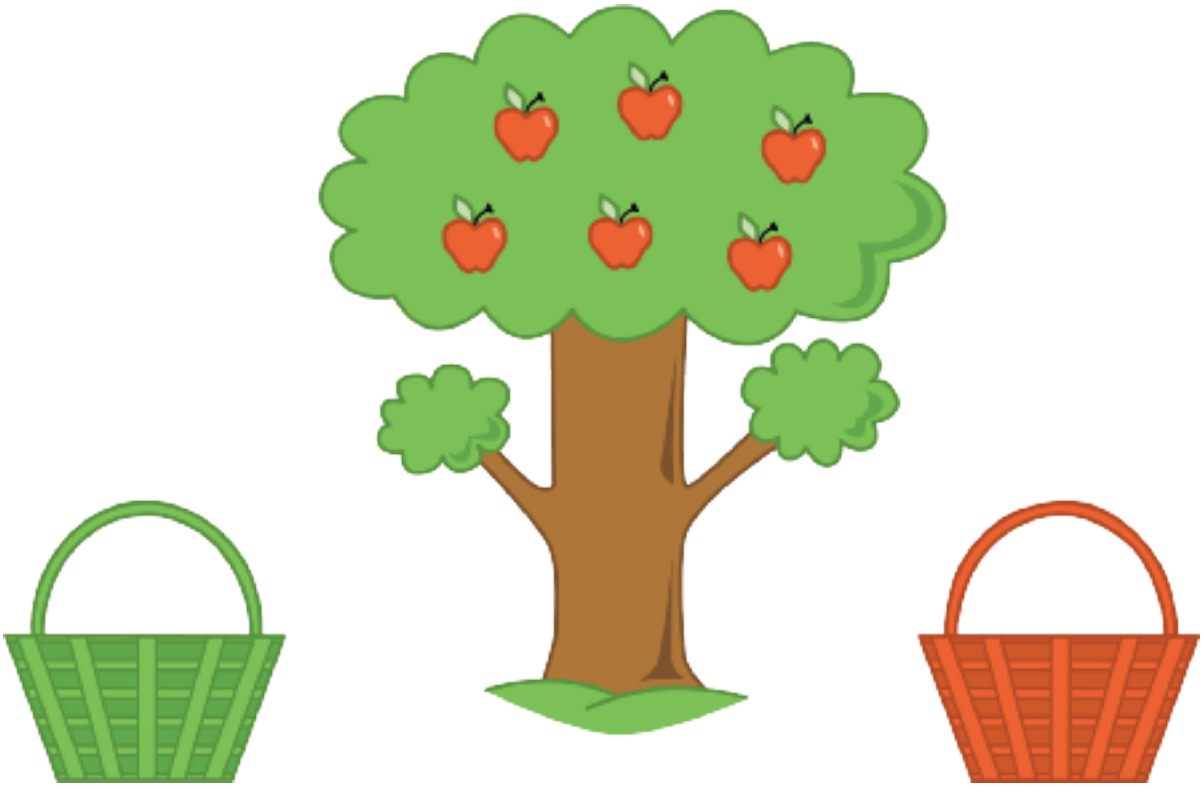
He put the rest of the pomegranates in a basket.

How many of the pomegranates were on the shelf?

Then how many of the pomegranates were in the basket?

Expression: _____

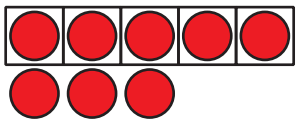
7.3: Introduce Math Stories, How Many of Each?



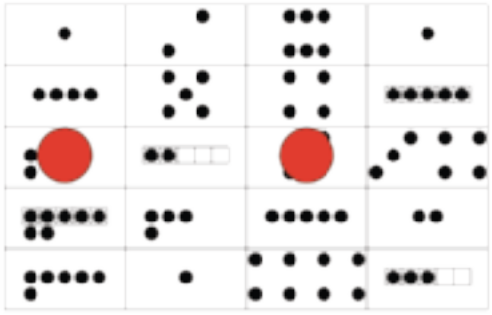
Choose a center.

What's Behind My Back?

5-frames



Make or Break Apart Numbers



Math Stories

Lesson 8: More Than One Way

- Let's find more than one way to solve a problem.

Warm-up: Number Talk: Expressions

Find the value of each expression.

- $3 + 1$
- $1 + 3$
- $4 - 1$
- $4 + 1$

8.1: Citrus Juice

Han squeezed 9 pieces of fruit to make juice.

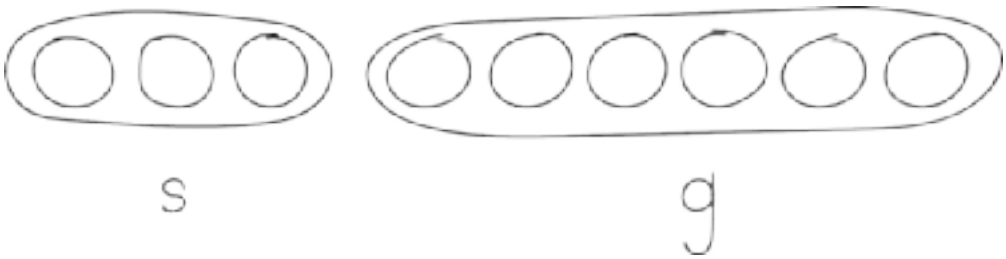
Some of the fruits were satsumas.

The rest of the fruits were grapefruits.

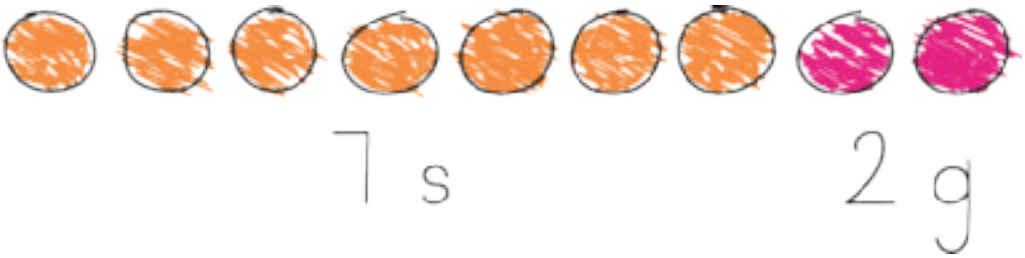
How many of the fruits were satsumas?

Then how many of the fruits were grapefruits?

Clare:



Diego:



Han squeezed 9 pieces of fruit to make juice.

Some of the fruits were satsumas.

The rest of the fruits were grapefruits.

How many of the fruits were satsumas?

Then how many of the fruits were grapefruits?

Show your thinking using objects, drawings, numbers, or words.

Expression: _____

8.2: Dates to Stuff

Andre and his older brother have 8 dates.

They stuff some of the dates with cheese.

They stuff the rest of the dates with almonds.

How many of the dates did they stuff with cheese?

Then how many of the dates did they stuff with almonds?

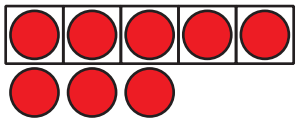
Expression: _____

8.3: Centers: Choice Time

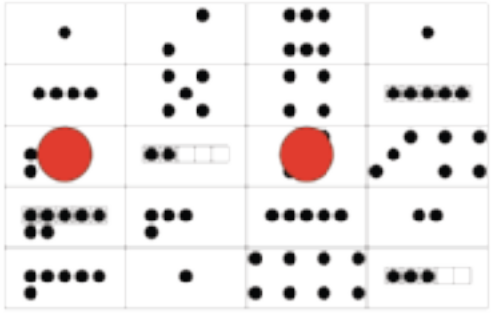
Choose a center.

What's Behind My Back?

5-frames



Make or Break Apart Numbers



Math Stories

Lesson 9: All of the Story Problems

- Let’s solve story problems.

9.1: All the Story Problems

1. Mai grew 7 tomatoes in her garden.

   She picked 5 of the tomatoes to make salsa.

   How many tomatoes are still in the garden?

Expression: _____

2. There are 9 tomatoes in Mai's garden.

   Some of the tomatoes are yellow.

   The rest of the tomatoes are red.

   How many of the tomatoes are yellow?

   Then how many of the tomatoes are red?

   Expression: _____

9.2: Make and Match Story Problems

Record your story problem.

Solve the story problem your partner told you.

Show your thinking using objects, drawings, numbers, or words.

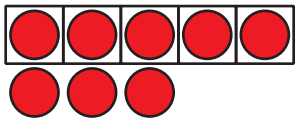
Expression: _____

9.3: Centers: Choice Time

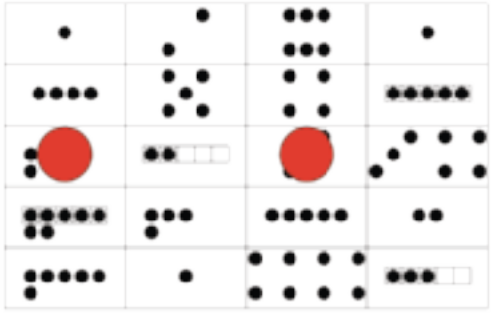
Choose a center.

What's Behind My Back?

5-frames



Make or Break Apart Numbers



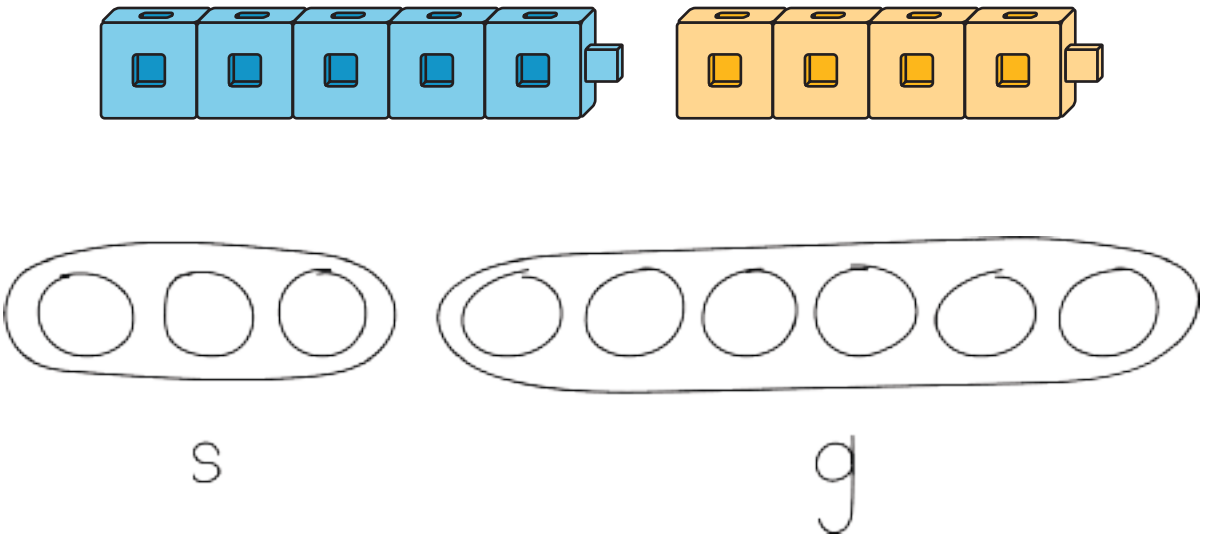
Math Stories

Section Summary

Section Summary
In this section, we solved story problems with more than one solution.

Han squeezed 9 pieces of fruit to make juice.
Some of the fruits were satsumas.
The rest of the fruits were grapefruits.
How many of the fruits were satsumas?
Then how many of the fruits were grapefruits?

We used objects and drawings to solve story problems.



7 s

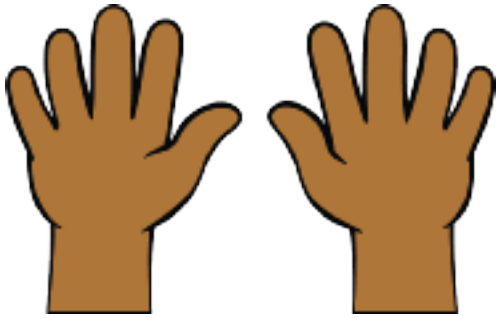
2 g

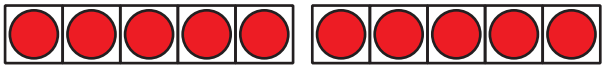
Lesson 10: Introduce the 10-frame

- Let’s make and use 10-frames.

Warm-up: Notice and Wonder: Fingers and 5-frames

What do you notice?
What do you wonder?





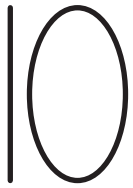
10.1: Introduce 10-frames

Cut out and glue the 5-frames to make each number.

1. 

2. 

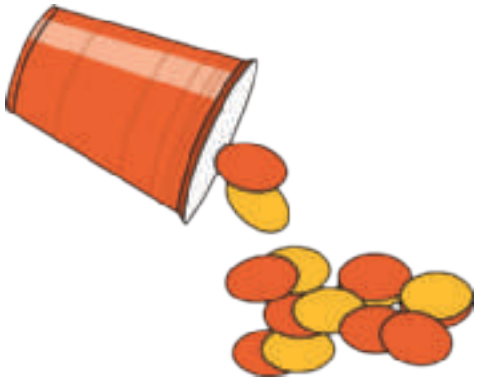
3. 

4. 

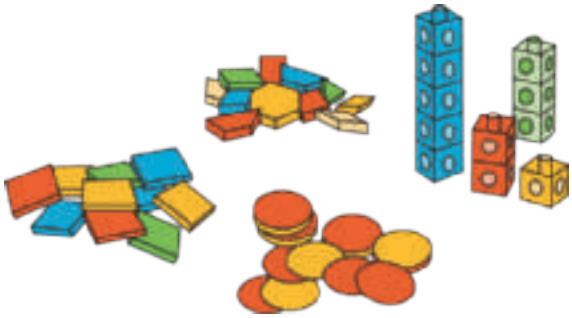
10.3: Centers: Choice Time

Choose a center.

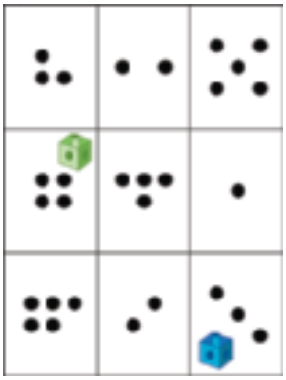
Shake and Spill



Counting Collections



Roll and Add

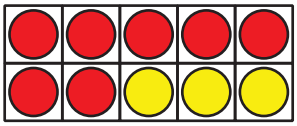


Lesson 11: Equations that Show 10

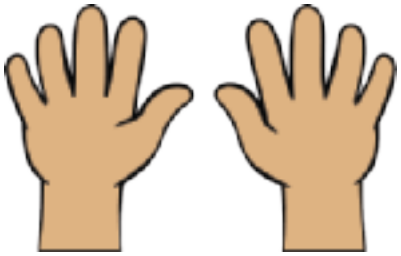
- Let's match equations to 10-frames and fingers.

Warm-up: Notice and Wonder: Expressions for 10

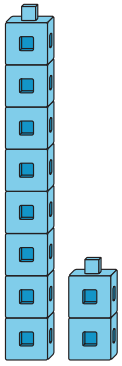
What do you notice?
What do you wonder?



$7 + 3$



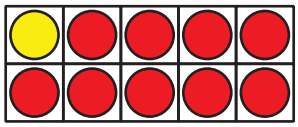
$5 + 5$



$8 + 2$

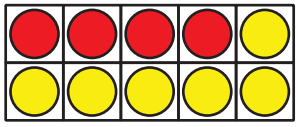
11.1: Match Equations and 10-frames

1.



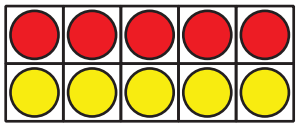
$10 = 7 + 3$

2.



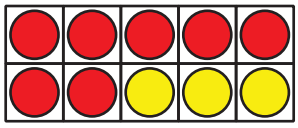
$10 = 8 + 2$

3.



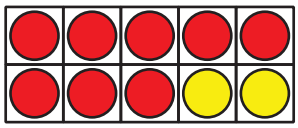
$10 = 1 + 9$

4.



$10 = 4 + 6$

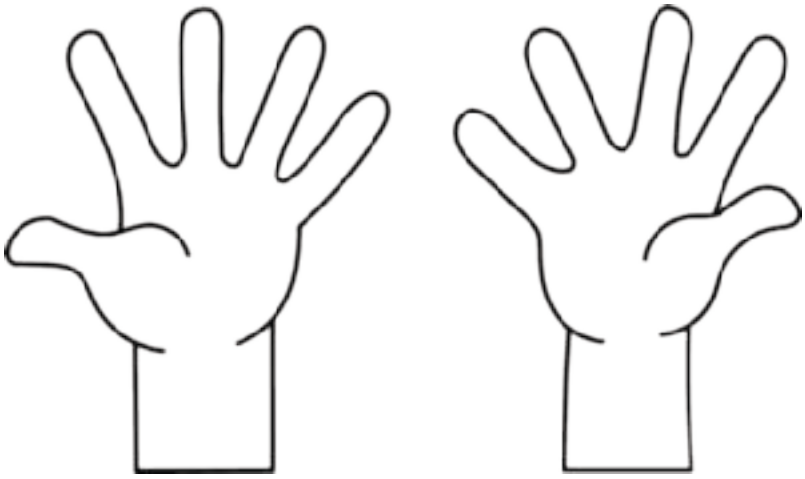
5.



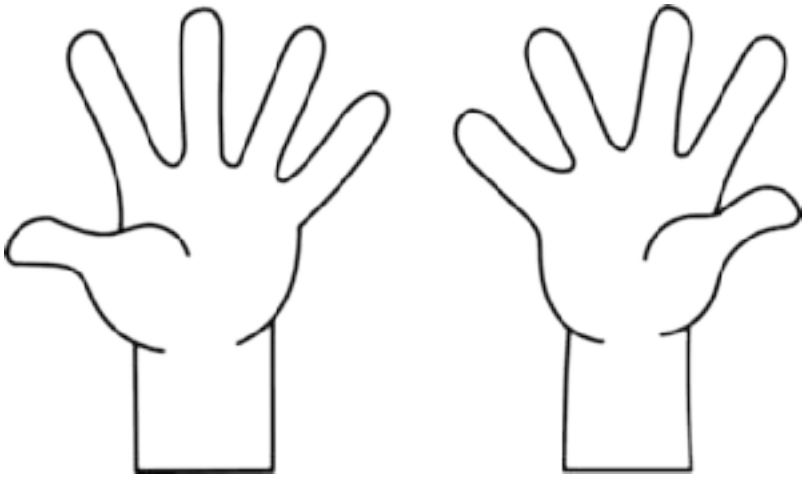
$10 = 5 + 5$

11.2: Represent Equations with Fingers

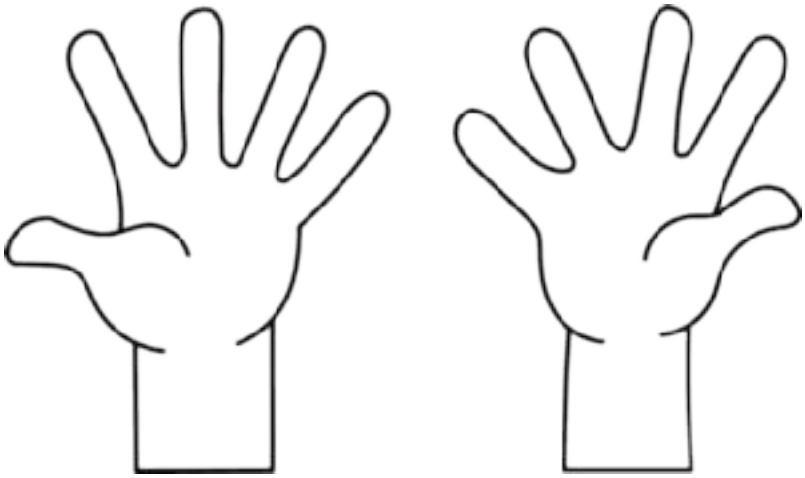
$10 = 6 + 4$



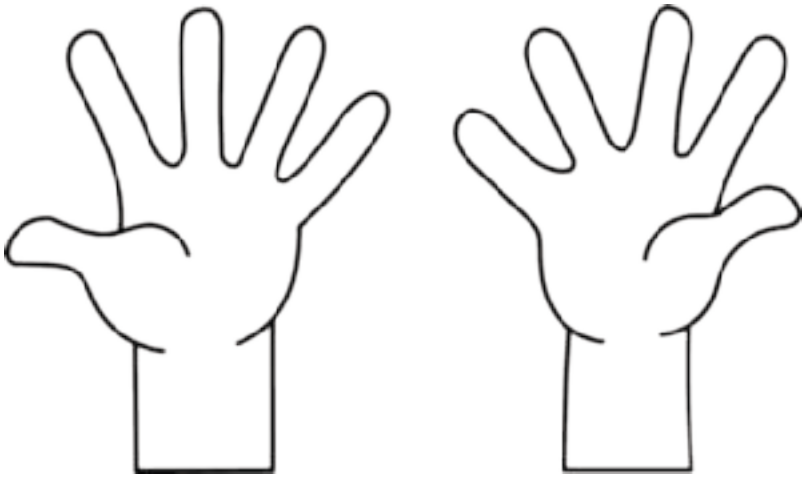
$10 = 9 + 1$



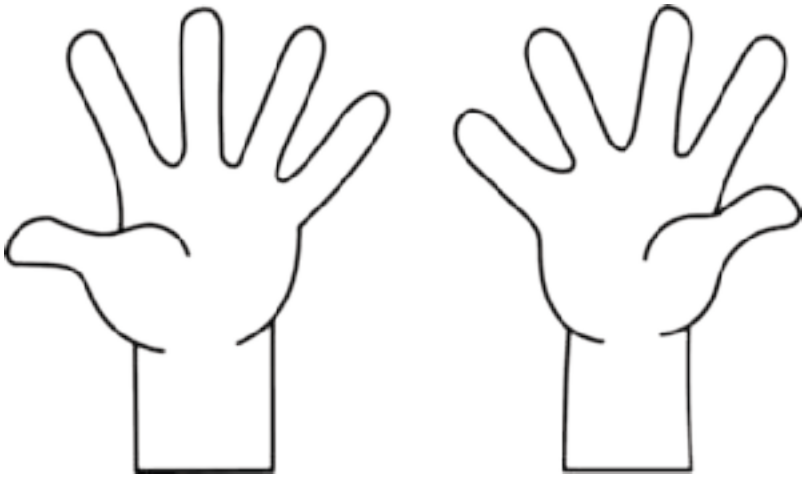
$10 = 5 + 5$



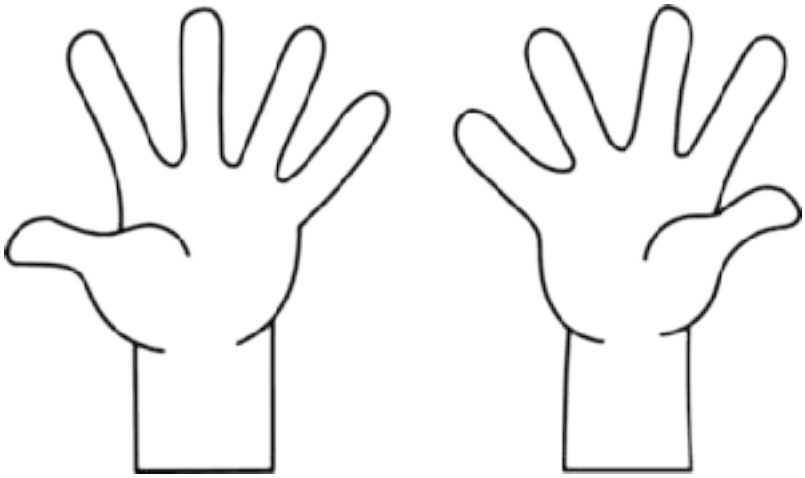
$10 = 3 + 7$



$10 = 8 + 2$



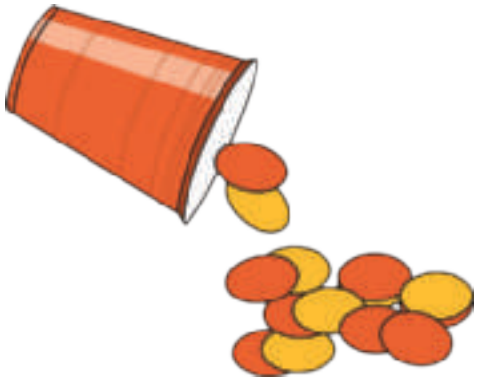
$10 = 1 + 9$



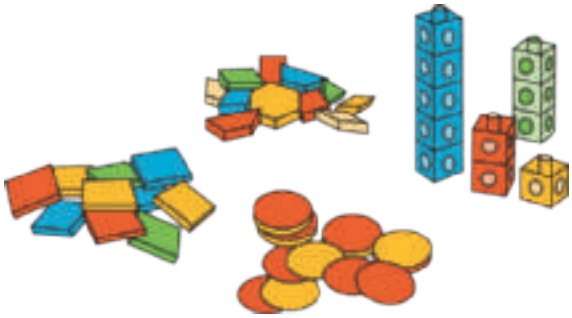
11.3: Centers: Choice Time

Choose a center.

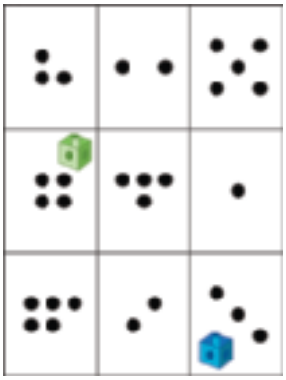
Shake and Spill



Counting Collections



Roll and Add



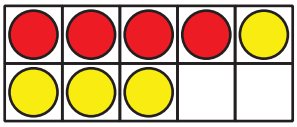
Lesson 12: How Many Are Missing?

- Let's fill 10-frames in different ways.

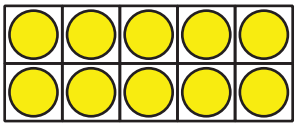
Warm-up: Which One Doesn't Belong: 10-frames

Which one doesn't belong?

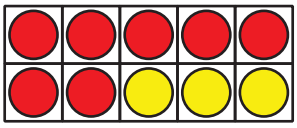
A



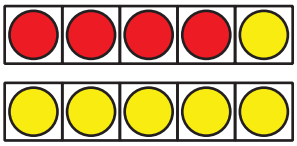
B



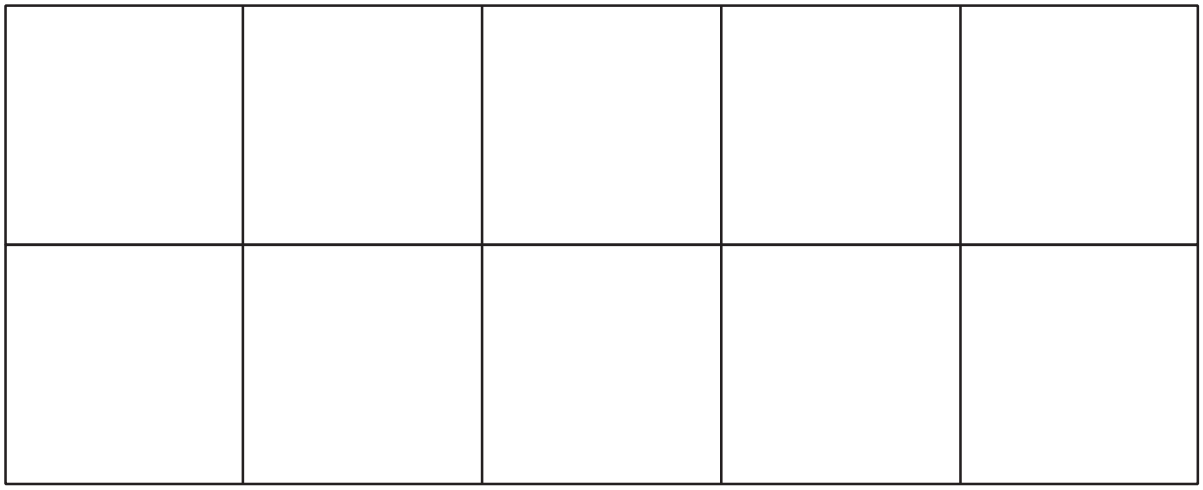
C



D



12.1: Shake, Spill, and Arrange with 10



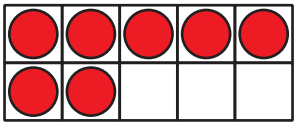
$10 = 5 + 5$ $10 = 9 + 1$ $10 = 4 + 6$

$10 = 2 + 8$ $10 = 6 + 4$ $10 = 3 + 7$

$10 = 1 + 9$ $10 = 8 + 2$ $10 = 5 + 5$

12.2: How Many to Fill the 10-frame?

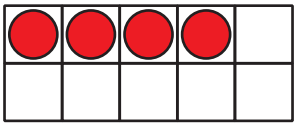
1.



_____

$10 = 7 + 3$ $10 = 8 + 2$ $10 = 5 + 5$

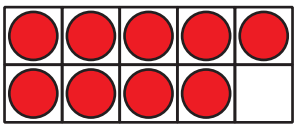
2.



_____

$10 = 8 + 2$ $10 = 1 + 9$ $10 = 4 + 6$

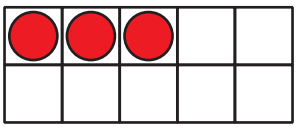
3.



_____

$10 = 9 + 1$ $10 = 5 + 5$ $10 = 7 + 3$

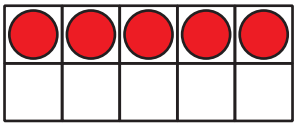
4.



_____

$10 = 5 + 5$ $10 = 3 + 7$ $10 = 2 + 8$

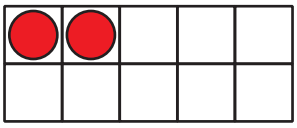
5.



_____

$10 = 9 + 1$ $10 = 6 + 4$ $10 = 5 + 5$

6.



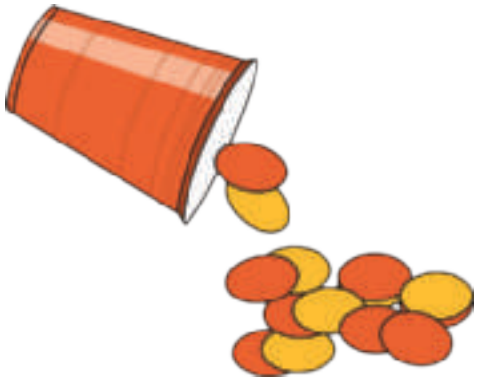
_____

$10 = 1 + 9$ $10 = 2 + 8$ $10 = 4 + 6$

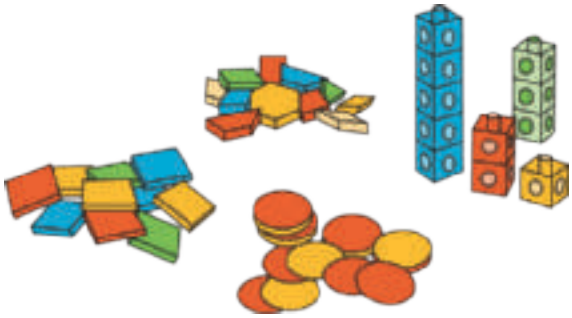
12.3: Centers: Choice Time

Choose a center.

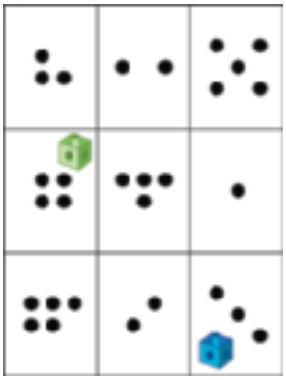
Shake and Spill



Counting Collections



Roll and Add

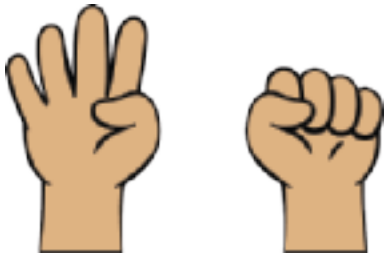


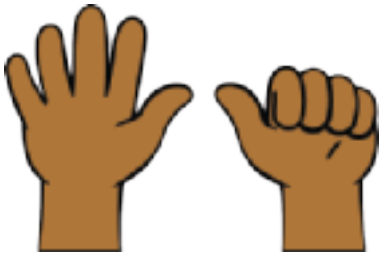
Lesson 13: Make 10

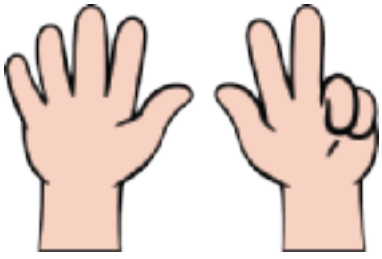
- Let’s make 10.

Warm-up: How Many Do You See: Fingers Up and Down

How many do you see?
How do you see them?







13.2: Make 10

3 _____ $10 = \_\_\_\_\_ + \_\_\_\_\_$

9 _____ $10 = \_\_\_\_\_ + \_\_\_\_\_$

2 _____ $10 = \_\_\_\_\_ + \_\_\_\_\_$

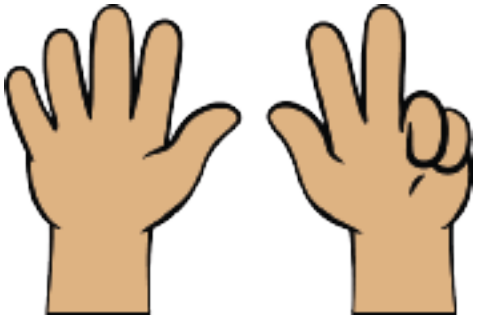
5 _____ $10 = \_\_\_\_\_ + \_\_\_\_\_$

7	_____	$10 = \_\_\_\_\_ + \_\_\_\_\_$
6	_____	$10 = \_\_\_\_\_ + \_\_\_\_\_$
8	_____	$10 = \_\_\_\_\_ + \_\_\_\_\_$
4	_____	$10 = \_\_\_\_\_ + \_\_\_\_\_$

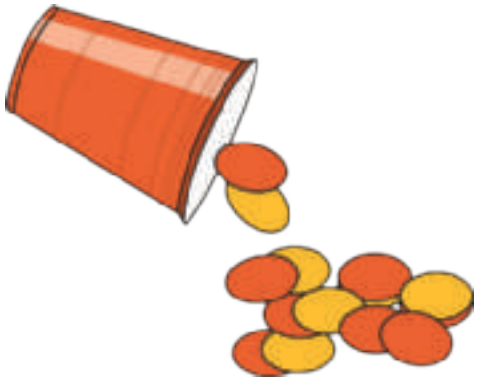
13.3: Centers: Choice Time

Choose a center.

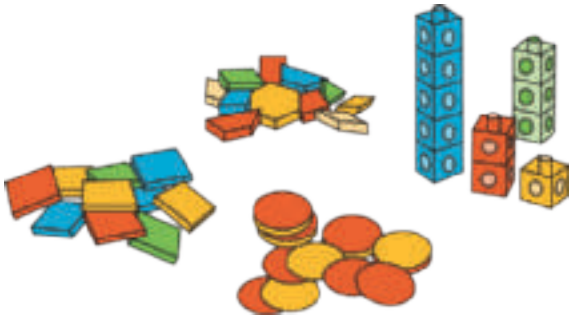
Math Fingers



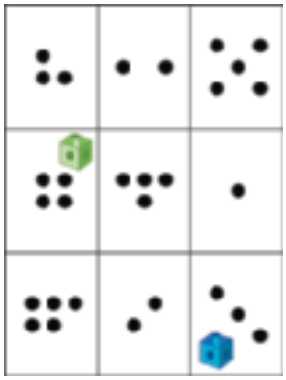
Shake and Spill



Counting Collections



Roll and Add



Lesson 14: Towers of 10

- Let’s figure out how many cubes are hidden.

Warm-up: What Do You Know About 10?

What do you know about 10?

14.2: How Many Cubes Are Hidden?

Han had a tower of 10 cubes.

He snapped it into 2 parts and hid 1 part behind his back.

He showed his partner 4 cubes.

How many cubes is Han hiding behind his back?

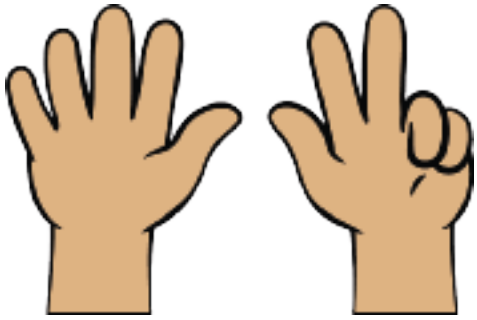
$$10 = \_\_\_\_\_ + \_\_\_\_\_$$

14.3: Centers: Choice Time

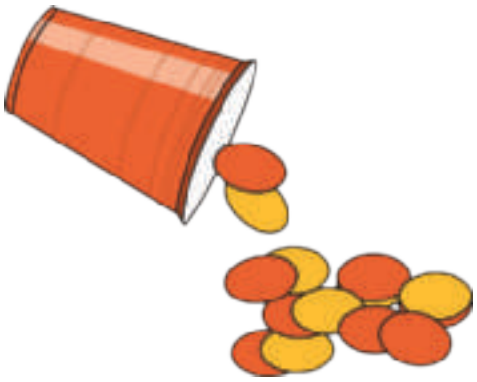
Choose a center.

What's Behind My Back?

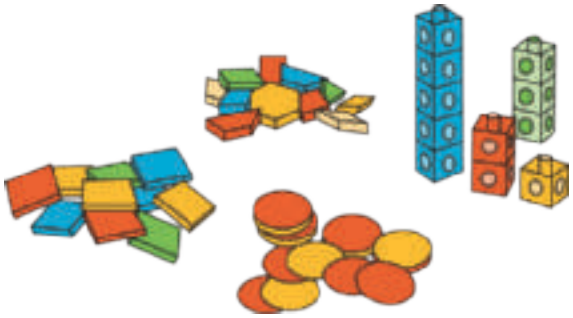
Math Fingers



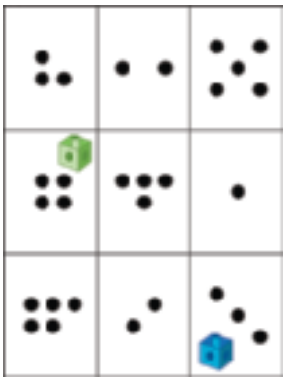
Shake and Spill



Counting Collections



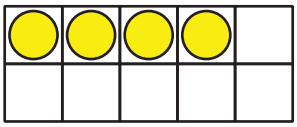
Roll and Add

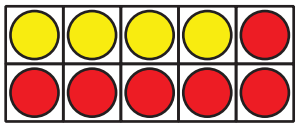


Section Summary

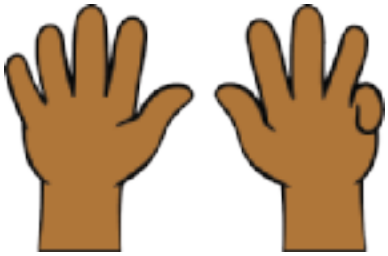
Section Summary
In this section, we found many different ways to make 10.

We used a 10-frame and our fingers to show numbers and figure out how many more are needed to make 10.

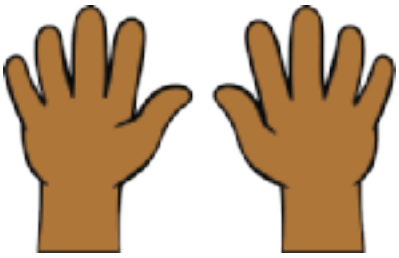




There are 4 counters.
We need 6 more counters to make 10.



There are 9 fingers.
We need to put up 1 more finger to make 10.



We used equations to show different ways to make 10.

$$10 = 4 + 6$$

$$10 = 9 + 1$$

Lesson 15: Lots of Fruit

- Let's make up story problems and solve them.

Warm-up: Notice and Wonder: Fruit Stand

What do you notice?
What do you wonder?

15.1: Fruit Story Problems

Solve the story problem.

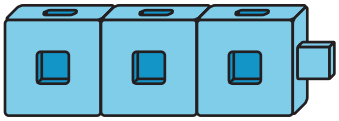
Show your thinking using objects, drawings, numbers, or words.

15.2: All the Solutions

Show your thinking using drawings, numbers, words, or objects.

Section A: Practice Problems

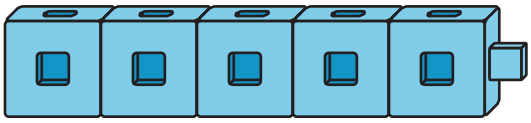
1. a.



How can you break apart 3 connecting cubes into 2 parts?

Show your thinking using drawings, numbers, words, or objects.

b.

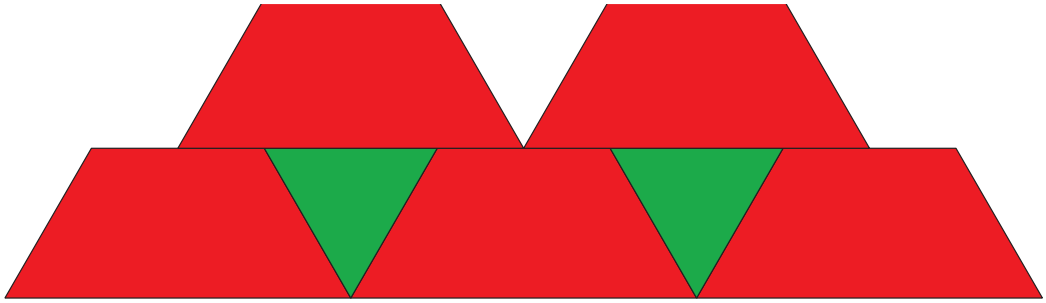


How can you break apart 5 connecting cubes into 2 parts?

Show your thinking using drawings, numbers, words, or objects.

(From Unit 5, Lesson 1.)

2. Jada made this pattern block design.



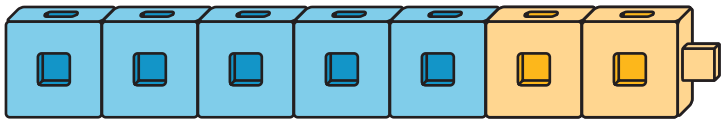
a. How many pattern blocks did Jada use? _____

b. Write an expression to show Jada's pattern blocks.

_____

(From Unit 5, Lesson 2.)

3. Mai wanted to break apart 7 into 2 parts.
   She made this tower to show her 2 parts.



a. Write an expression for Mai's connecting cubes.

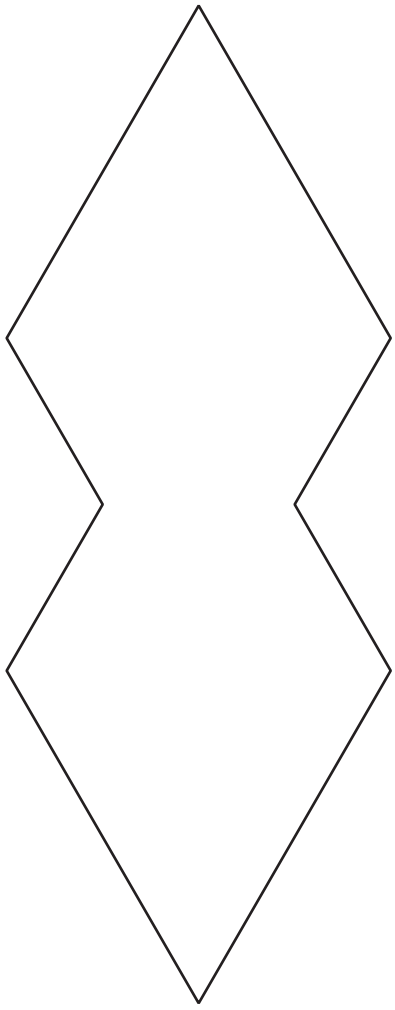
b. Show 1 more way to break apart 7 cubes into 2 parts.

   Show your thinking using drawings, numbers, words, or objects.

(From Unit 5, Lesson 3.)

4. **Exploration**

Han made this pattern block design using two different kinds of pattern blocks.



He wrote the expression $6 + 2$ to describe his design.

What pattern blocks did Han use?

5. **Exploration**

a. Show all the ways to snap a tower of 4 cubes into 2 parts.

b. Show all the ways to snap a tower of 5 cubes into 2 parts.

c. Show all the ways to snap a tower of 6 cubes into 2 parts.

d. What patterns do you notice?

Section B: Practice Problems

1. There are 6 red crayons and 3 blue crayons on the desk.

   How many crayons are on the desk?

   Show your thinking using drawings, numbers, words, or objects.

(From Unit 5, Lesson 5.)

2. There are 9 crayons on the desk.

   Some of the crayons are red and the rest are blue.

   Use drawings, numbers, words, or objects to show what the crayons could look like.

(From Unit 5, Lesson 6.)

3. There are 8 students eating lunch at the table.

   Some of them are drinking milk.

   The rest are drinking water.

   How many of the students were drinking milk?

   Then how many of the students were drinking water?

   Show your thinking using drawings, numbers, words, or objects.

(From Unit 5, Lesson 7.)

4. There are 9 animals swimming in the water.

   Some of them are dolphins and the rest are seals.

   How many of the animals are dolphins?

   Then how many of the animals are seals?

   Show your thinking using drawings, numbers, words, or objects.

   Find more than 1 solution to the story problem.

(From Unit 5, Lesson 8.)

5. a. There are 3 kids playing hopscotch.

   There are 4 kids playing tag.

   How many kids are there playing altogether?

   Show your thinking using drawings, numbers, words, or objects.

b. There are 8 kids on the playground.

Some of the kids are playing hopscotch.

Some of the kids are playing tag.

How many of the kids are playing hopscotch?

Then how many of the kids are playing tag?

Show your thinking using drawings, numbers, words, or objects.

(From Unit 5, Lesson 9.)

6. **Exploration**

Students need a connecting cube and number mat 1–5.

There are 8 ducklings hiding in the grass.
Some of the ducklings are brown and the rest of the ducklings are yellow.

Roll the cube onto the mat to find how many brown ducklings there are.
Then write the number of yellow ducklings.

brown	yellow

Did you find all of the possible numbers of brown and yellow ducklings?

7. **Exploration**

There are 7 turtles.
Some of the turtles are swimming in the pond.
The rest of the turtles are lying in the sun.
How many turtles are swimming in the pond?
Then how many are lying in the sun?

Andre says that the solution:

6 turtles swimming and 1 turtle lying in the sun

is the same as the solution:

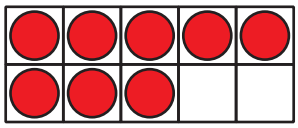
1 turtle swimming and 6 turtles lying in the sun.

Do you agree with Andre?

Section C: Practice Problems

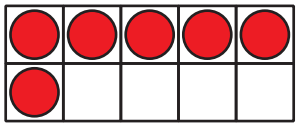
1. How many counters are there?

a.



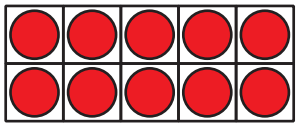
_____

b.



_____

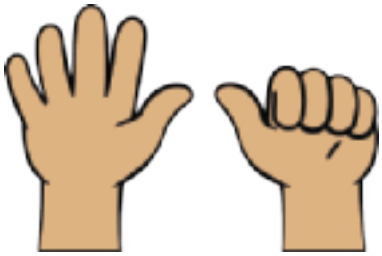
c.

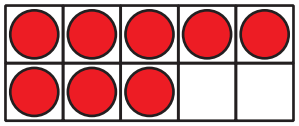


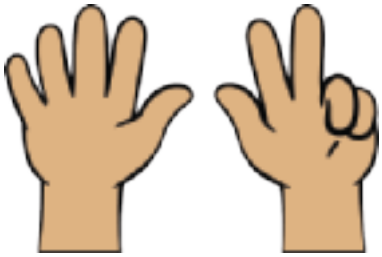
_____

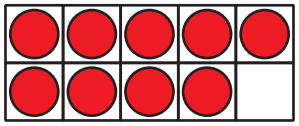
(From Unit 5, Lesson 10.)

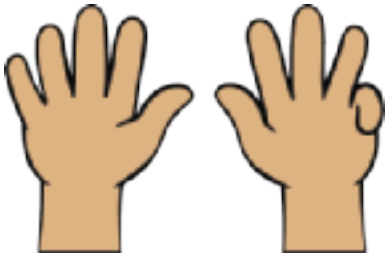
2. Draw a line from the fingers to the ten-frame that shows the same number.

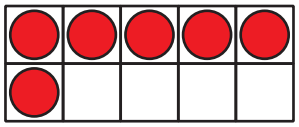






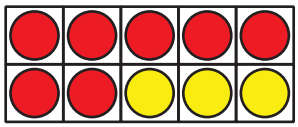






(From Unit 5, Lesson 10.)

3. Circle the equation that matches the 10-frame.



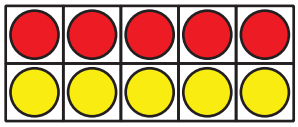
A. $7 = 5 + 2$

B. $10 = 7 + 3$

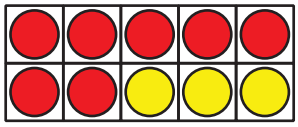
C. $10 = 8 + 2$

(From Unit 5, Lesson 11.)

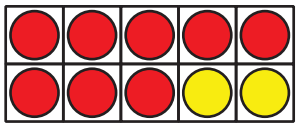
4. Draw a line from each 10-frame to the equation it matches.



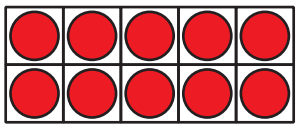
$10 = 8 + 2$



$10 = 10 + 0$



$10 = 5 + 5$

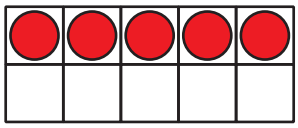


$10 = 7 + 3$

(From Unit 5, Lesson 12.)

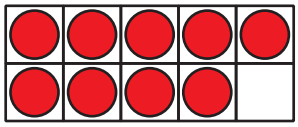
5. Write a number to show how many counters are needed to fill the 10-frame.

a.



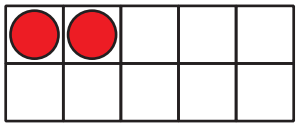
_____

b.



_____

c.



_____

(From Unit 5, Lesson 12.)

6. For each number, write the number you need to add to make 10.

   Use a 10-frame and two-color counters if it helps you.

   a. 6 _____

   b. 8 _____

   c. 1 _____

   d. 7 _____

(From Unit 5, Lesson 13.)

7. Mai has a tower of 10 connecting cubes.

   She snaps the tower into 2 parts and puts one part behind her back.

   She shows her partner 3 cubes.

   How many cubes is Mai hiding?

   _____

   Show your thinking using drawings, numbers, words, or objects.

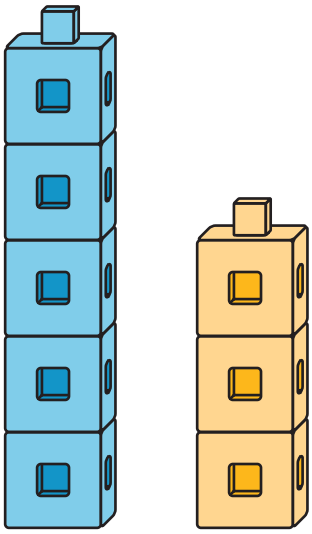
   (From Unit 5, Lesson 14.)

8. **Exploration**

Clare is playing What's Behind My Back? She has a tower of 10 cubes.

She accidentally snaps the tower into 3 pieces.

She shows these two towers.



How many cubes does Clare have behind her back?

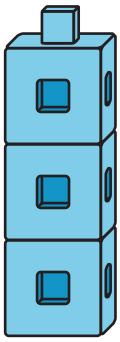
_____

9. **Exploration**

Diego is playing What's Behind My Back? He has a tower of 10 cubes.

He accidentally snaps the tower into 3 pieces.

He shows this tower.



How many cubes could be in Diego's other two towers?

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