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**A M I D  O N**  
**A P L A N E T**

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# **Connecting the Standards for Mathematical Practice to Classroom Instructional Practice**

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University of Mississippi**



# Group Norms

# Group Norms

Together

# Group Norms

Work Together

# Group Norms

Struggle Together  
Work Together

# Group Norms

Proceed Together  
Struggle Together  
Work Together



# Group Norms

Succeed Together  
Proceed Together  
Struggle Together  
Work Together

# Standards for Mathematical Practice

Make sense of problems and persevere in solving them.

Reason abstractly and quantitatively.

Construct viable arguments and critique the reasoning of others.

Model with mathematics.

Use appropriate tools strategically.

Attend to precision.

Look for and make use of structure.

Look for and express regularity in repeated reasoning.

# Problem v. Exercise

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The use or application of  
a process

# Problem v. Exercise

Something that is difficult to achieve or accomplish without a known solution path

The use or application of a process

# Inquiry Cube

# **Inquiry Cube**

**What is on the bottom of the cube?**

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# Cognitively Guided Instruction

There are \*\* children in an after-school program.  
They need to make groups of \*\* for an activity.

There are \_\_\_ children in an after-school program.  
They need to make groups of \_\_\_ for an activity.

How many groups will there be?

There are 18 children in an after-school program.  
They need to make groups of 3 for an activity.

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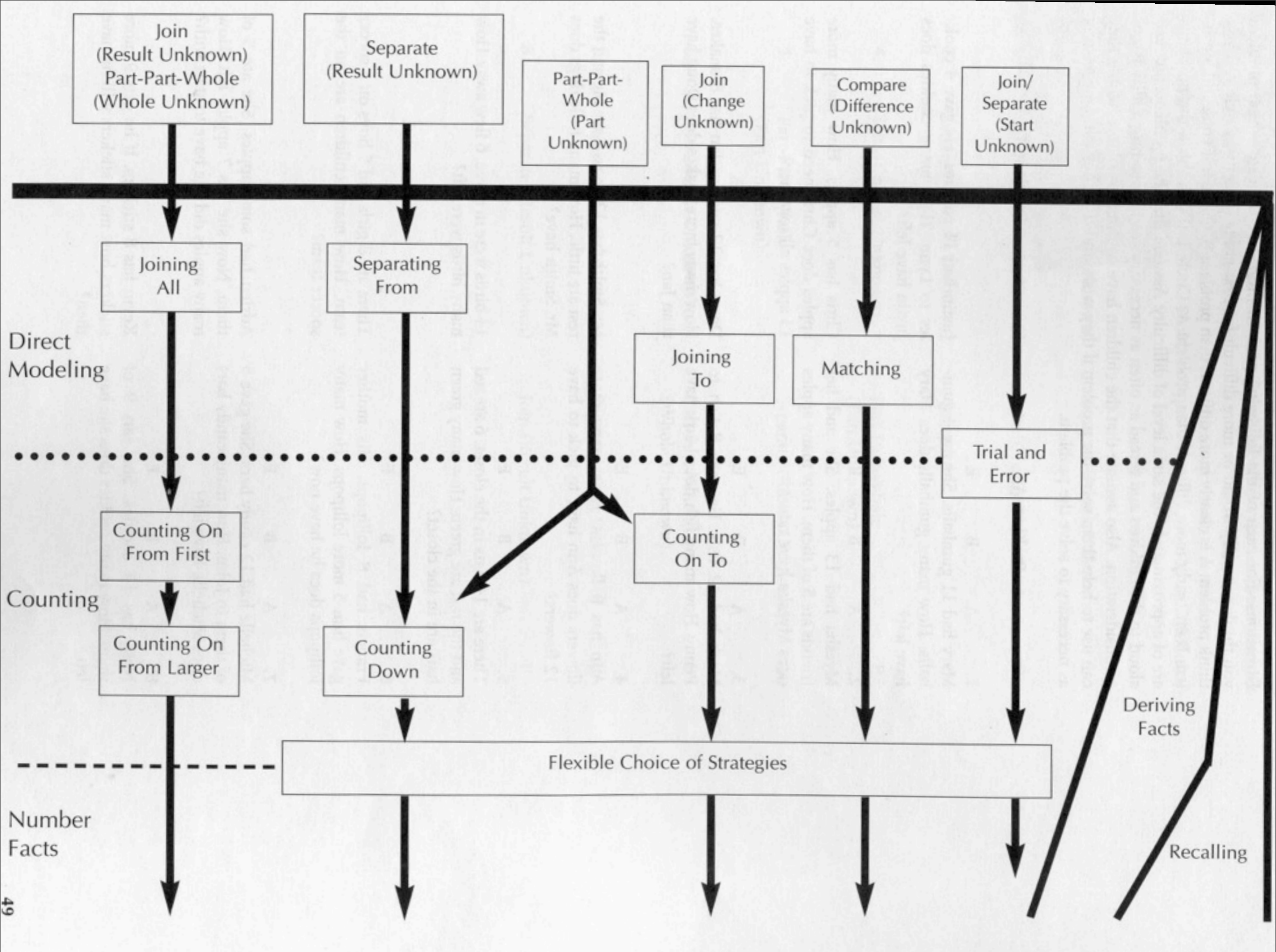
How many groups will there be?

*Solve this subtraction problem in as many ways possible.*

## Appendix A: CGI Story Problem Framework (Choose contexts and number sizes appropriate for your students)

<b>JOIN</b>	<p><b>(JRU) JOIN RESULT UNKNOWN</b></p> <p>Connie had 35 marbles. Juan gave her 18 more marbles. How many marbles does Connie have all together?</p> $35 + 18 = \square$	<p><b>(JCU) JOIN CHANGE UNKNOWN</b></p> <p>Connie has 35 marbles. How many more marbles does she need to have to have 53 all together?</p> $35 + \square = 53$	<p><b>(JSU) JOIN START UNKNOWN</b></p> <p>Connie had some marbles. Juan gave her 18 more marbles. Now she has 53 marbles. How many marbles did Connie have to start with?</p> $\square + 18 = 53$	
<b>SEPARATE</b>	<p><b>(SRU) SEPARATE RESULT UNKNOWN</b></p> <p>Connie had 53 marbles. She gave 35 to Juan. How many marbles does she have now?</p> $53 - 35 = \square$	<p><b>(SCU) SEPARATE CHANGE UNKNOWN</b></p> <p>Connie had 53 marbles. She gave some to Juan. Now she has 18 left. How many did she give to Juan?</p> $53 - \square = 18$	<p><b>(SSU) SEPARATE START UNKNOWN</b></p> <p>Connie had some marbles. She gave 35 to Juan. Now she has 18 marbles left. How many marbles did she have to start with?</p> $\square - 35 = 18$	
<b>PART-PART-WHOLE</b>	<p><b>(PPW-WU) PART-PART-WHOLE (WHOLE UNKNOWN)</b></p> <p>Connie has 35 red marbles and 18 blue marbles. How many marbles does she have?</p> $35 + 18 = \square$	<p><b>(PPW-PU) PART-PART-WHOLE (PART-UNKNOWN)</b></p> <p>Connie has 53 marbles. 35 are red and the rest are blue. How many blue marbles does Connie have?</p> $53 - 35 = \square \quad 35 + \square = 53$		
<b>COMPARE</b>	<p><b>(CDU) COMPARE DIFFERENCE UNKNOWN</b></p> <p>Connie has 53 marbles. Juan has 35 marbles. How many more marbles does Connie have than Juan?</p> $53 - 35 = \square \quad 35 + \square = 53$	<p><b>(CQU) COMPARE QUANTITY UNKNOWN</b></p> <p>Juan has 35 marbles. Connie has 18 more than Juan. How many marbles does Connie have?</p> $35 + 18 = \square$	<p><b>(CRU) COMPARE REFERENT UNKNOWN</b></p> <p>Connie has 53 marbles. She has 35 more marbles than Juan. How many marbles does Juan have?</p> $53 - 35 = \square \quad 35 + \square = 53$	
<b>(M) MULTIPLICATION</b>		<b>(MD) MEASUREMENT DIVISION</b>		<b>(PD) PARTITIVE DIVISION</b>
<p>Connie has 3 bags of cookies. There are 15 cookies in each bag. How many cookies does Connie have all together?</p> $3 \times 15 = \square$		<p>Connie has 45 cookies. She wants to put 15 cookies in each bag. How many bags can she fill?</p> $45/15 = \square$		<p>Connie has 45 cookies. She wants to put the cookies into 3 bags with the same number in each bag. How many cookies are in each bag?</p> $45/3 = \square$

Adapted with permission from: Carpenter, T.P., Fennema E., Franke, M.L., Levi, L., Empson, S.B. 1999. *Children's Mathematical Thinking. Cognitively Guided Instruction*. Portsmouth, NH: Heinemann.



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# Number Tools

The Jump, Jump Game

Collecting Pennies

Close Enough

# The Jump Jump Game

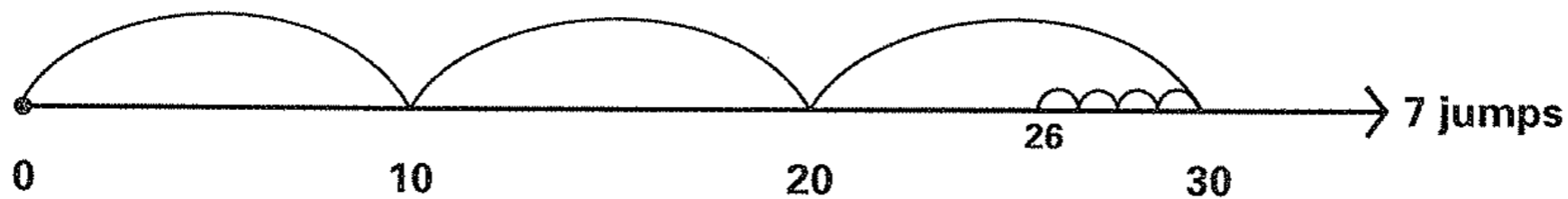
## Object of the Game:

Use a number line to "jump" from one number to another in as *few jumps as possible*. Compare your score with a partner.

## To Play:

To get to a number, you can make *jumps of only three lengths: 1, 10, and 100*. You can show your jumps on the number line by drawing curves of different lengths: a small curve for a jump length of 1, a medium curve for a jump length of 10, and a large curve for a jump length of 100. You can jump forward or backward.

For Example: **Jump from 0 to 26.**

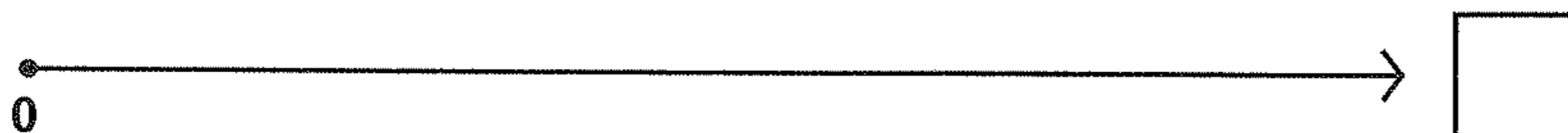


Complete Rounds 1 and 2 individually. After each round, write the total number of jumps you made next to each number line.

**Round 1. Jump from 0 to 53.**



**Round 2. Jump from 0 to 29.**

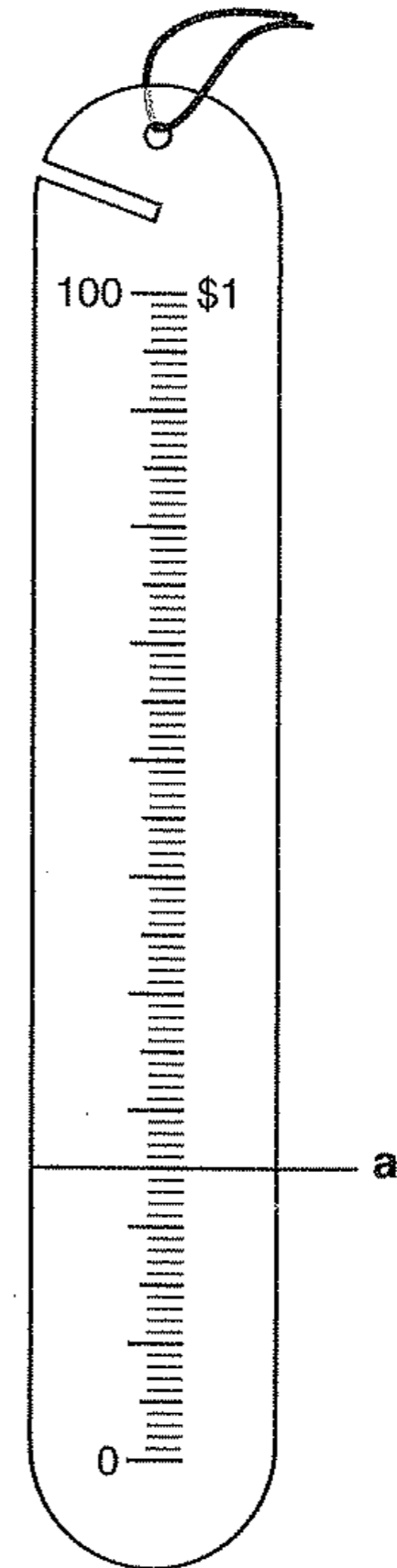


# Collecting Pennies

Here is a penny-collecting tube. The tube is completely full when it contains 100 pennies (\$1.00).

1. Draw a line to show the height of the tube if it contained each of these amounts of money. Write the corresponding letter next to each height. As an example, problem a has been done for you.

- |           |           |
|-----------|-----------|
| a. \$0.25 | h. \$0.80 |
| b. \$0.50 | i. \$0.98 |
| c. \$0.75 | j. \$0.09 |
| d. \$0.20 | k. \$1.00 |
| e. \$0.02 | l. \$0.10 |
| f. \$0.77 | m. \$0.67 |
| g. \$0.40 |           |



# Close Enough

Draw a circle around the number closest to the correct answer. Do not use your calculator or make precise calculations. Write a short explanation of how you made your selection.

1.  $101 \times 11 =$

800

900

1,000

1,100

1,200

4.  $91 \times 19 \times 19 =$

500

5,000

50,000

500,000

5,000,000

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# The Jactus

How is the Jactus growing?

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