



The Great Jump Rope Mysteries.

Write variable expressions based on the clues given. Be sure to explain how you solved each mystery and prove that your solution is correct.

1. Three students decided to time each other jumping rope. The second student did six more than the first student. The third student did six less than the first student. Select a variable and write expressions to represent the number of jumps each student did.

Student one: _____

Student two: _____

Student three: _____

If the second student did 25 jumps, what equation could you write to represent this? _____

How many jumps did each person do? Explain how you found the answers.

How can you prove that you are correct?

2. Five students decided to time each other jumping rope. The first student did seven less than the second student. The third student did five more than the second student. The fourth student did twice as many as the second student.

If y represents the number of jumps of the second student, write variable expressions for the other four students:

Student one: _____

Student two: y

Student three: _____

Student four: _____

Student five: _____

If the value of y is 16, how many times did each student jump? Explain how you found your answers.



The Great Jump Rope Mysteries. **KEY**

Write variable expressions based on the clues given. Be sure to explain how you solved each mystery and prove that your solution is correct.

1. Three students decided to time each other jumping rope. The second student did six more than the first student. The third student did six less than the first student. Select a variable and write expressions to represent the number of jumps each student did. **ANSWERS MAY VARY**

Student one: _____ n _____

Student two: _____ $n + 6$ _____

Student three: _____ $n - 6$ _____

If the second student did 25 jumps, what equation could you write to represent this? _____ $n + 6 = 25$ _____

How many jumps did each person do? Explain how you found the answers.

One: 19 two: 25 three: 13; accept reasonable explanations

How can you prove that you are correct?

2. Four students decided to time each other jumping rope. The first student did seven less than the second student. The third student did five more than the second student. The fourth student did twice as many as the second student.

If y represents the number of jumps of the second student, write variable expressions for the other four students: **ANSWERS MAY VARY**

Student one: _____ $y - 7$ _____

Student two: y

Student three: _____ $y + 5$ _____

Student four: _____ $2y$ _____

If the value of y is 21, how many times did each student jump? Explain how you found your answers.

One: 14; two : 21; three: 26; four: 42; accept reasonable explanations

Variable Expressions Chart

| Variable Expression | Write the Expression in Words | Evaluate |
|------------------------------------|--|--|
| Example: $n + 4$ | <i>a number increased by 4; 4 added to a number; a number plus 4; 4 more than a number</i> | <i>If n is 25; $25 + 4$ is 29</i> |
| | | |
| | | |
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| | | |
| | | |



TEAM TIME

Name _____

You will be collecting data and completing the chart below for students in your group. Each person will do **one** of the following activities: jumping jacks, jumping rope, hopping on one foot or bouncing and catching a ball.

MATERIALS: jump rope
 Tennis ball
 Stop watch or clock

DIRECTIONS: Before the team begins, each person should select one activity that they will be doing for the team. The four jobs are Participant, Counter, Timer and Recorder. Each member of the team will take a turn doing each job. Participants will be timed for 30 seconds. When the team is done, the numbers will need to be given to the teacher for the class chart.

My activity is _____

Our Team results:

Jumping jacks in 30 seconds: _____

Jumps with a jump rope in 30 seconds: _____

Hops on one foot in 30 seconds: _____

Balls bounced and caught in 30 seconds: _____

Look at the class chart and find the smallest number.

The smallest number is _____.

*Let's imagine that this number is called n because it is a **variable that can change**.*

Look at the class chart and find the largest number.

The largest number is _____.

How does the largest number compare to the smallest number? Try to **describe this in words**: _____

Share your ideas with the class.

How can we write a variable expression using n , to compare the smallest and largest numbers?

| <i>Variable expressions</i> | <i>Explained in words</i> |
|-----------------------------|---------------------------|
| | |
| | |
| | |
| | |

If your number in this activity is represented by x , what variable expressions would you write for each of your teammates?

Check your accuracy by evaluating each expression for your value of x .

Name: _____ Date: _____



HOW FAST CAN YOU STACK?

You will be timed trying to stack ten cubes in to a single tower as quickly as possible. You will have one practice trial. Use the table below to record your name and your three trial results.

- RULES:**
- All the knobs on the linking cubes must be upright.
 - Hands must be flat on the desk when you begin.
 - When you stack the cubes in the tower and let go, the tower must remain standing.
 - The teacher will be calling out time in seconds. **Listen carefully for your time.**

RESULTS OF STACKING TEN CUBES

NUMBER OF SECONDS FOR EACH TRIAL

| NAME | Seconds Trial 1 | Seconds Trial 2 | Seconds Trial 3 | Total seconds |
|------|--------------------|--------------------|--------------------|---------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

B. In the table above, find out the results for three students in your class. Write their data in the table.

C. In this activity, what number is *variable*? _____

Why? _____

D. In this activity, what number is *constant*? _____

Why? _____

E. If the number of seconds you needed in trial 1 is called n , how would you describe trial 2? _____

Trial 3? _____

Total? _____

F. A classmate's results are listed below. Please help her write *variable expressions* for her results:

| NAME | Seconds in trial 1 | Seconds in trial 2 | Seconds in trial 3 | Total seconds |
|---------------|--------------------|--------------------|--------------------|---------------|
| <i>Malena</i> | 9 | 12 | 11 | 32 |
| expression | n | | | |

CHALLENGE! CHALLENGE! CHALLENGE! Can you learn Mr. Smith's times using variable expressions? Use the value of n in Malena's table to find out Mr. Smith's results. Show your work in her table below. **OOPS!** One of the expressions is missing! Can you figure this out?

| NAME | Seconds in trial 1 | Seconds in trial 2 | Seconds in trial 3 | Total seconds |
|------------------|--------------------|--------------------|--------------------|---------------|
| <i>Mr. Smith</i> | $n+4$ | ?????????? | $n-3$ | $4n-2$ |
| # seconds | | | | |

Now it's time to write equations for Malena and Mr. Smith. After writing it in symbols, describe it in words.

HOW FAST CAN YOU STACK? ANSWER KEY

C. The number of seconds is variable because the number can change.

D. The number of cubes is constant because there are always ten.

E. Answers vary.

F. Answers may vary

Trial two could be $n + 3$

Trial three could be $2n - 7$

Total could be $3n + 5$

CHALLENGE:

Trial 1 is 13 seconds

Trial 2 is 15 seconds

Trial 3 is 6 seconds

Trial 4 is 34 seconds

Equations vary; Mr. Smith could have the equation $34 = 4n - 2$