



*Who is getting a better deal? Explain.*

*As you read the task below, underline any word you think might be important. Write a question mark next to any concept you don't understand and circle any word you don't understand. Draw a box around the question or task you are being asked to complete, if any, and number the prompts.*

## Who's Alice?

Once upon a time (actually, in 1865), a man wrote a story about the adventures of an imaginary girl named Alice who traveled to a place called Wonderland. The story quickly became a best seller in England and has since been translated into dozens of other languages. The author, Charles Lutwidge Dodgson, used the pen name Lewis Carroll. In addition to his fiction about Alice, he wrote books about mathematical logic. In this unit, one of Alice's adventures is the basis for your exploration of some ideas about numeric operations, graphs, and algebraic formulas.

In 1865, a book was published that would become the most popular children's book in England: *Alice's Adventures in Wonderland*. The author, Lewis Carroll, lived from 1832 to 1898. Lewis Carroll also wrote *Through the Looking-Glass and What Alice Found There*, a sequel to his original story.



## The Situation

Read this excerpt from *Alice's Adventures in Wonderland*. Then answer the questions that follow.

[Alice] found a little bottle . . . , and tied round the neck of the bottle was a paper label, with the words "DRINK ME" beautifully printed on it in large letters. . . .

So Alice ventured to taste it, and finding it very nice . . . , she very soon finished it off.

"What a curious feeling!" said Alice. "I must be shutting up like a telescope!"

And so it was indeed: she was now only ten inches high. . . .

Soon her eye fell on a little glass box that was lying under the table: she opened it, and found in it a very small cake, on which the words "EAT ME" were beautifully marked in currants. . . .

So she set to work, and very soon finished off the cake.

"Curiouser and curiouser!" cried Alice. . . . "Now I'm opening out like the largest telescope that ever was! Good-bye, feet!" (for when she looked down at her feet, they seemed to be almost out of sight, they were getting so far off). . . .

Just at this moment her head struck against the roof of the hall.

### Vocabulary/Concept Bank

Important term	Definition

1. What is another way that we could write $5+5+5+5+5+5$ ?	
2. What is another way that we could write $5*5*5*5*5*5$ ?	
3. Write a rule or equation for # 1	
4. Write a rule or equation for # 2	

In Lewis Carroll's story, when Alice drinks from the bottle, she grows shorter. When she eats the cake, she grows taller. But Carroll doesn't say how much shorter or how much taller or even how tall Alice was to start with.

Assume for every ounce of cake Alice eats, her height doubles. For every ounce of beverage she drinks, her height is cut in half.

1. What happens to Alice's height if she eats 2 ounces of cake?	
2. What happens to her height if she eats 5 ounces?	
3. Find a rule for what happens to Alice's height when she eats $C$ ounces of cake. Explain your rule in words and/or in symbols.	
4. What happens to Alice's height if she drinks 4 ounces of beverage?	
5. What happens to her height if she drinks 6 ounces?	
6. Find a rule for what happens to Alice's height when she drinks $B$ ounces of beverage. Explain your rule in words and/or in symbols.	