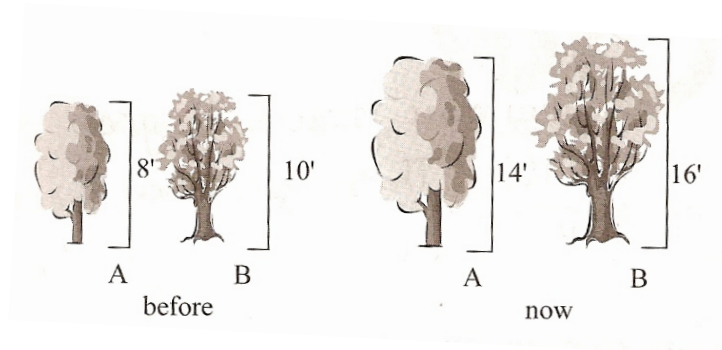


In this activity we will revisit the tree activity we were considering earlier today. Here is a reminder of the situation:



In a sixth-grade class some students reasoned about the Trees situation in the following ways:

Robert

Both trees grew the same amount 6 ft.  
B is always gone to be 2 ft. taller  
than A.

Dan

A grew 75% of its height, but B  
grew a little less— 60% of its  
height.

P.J.

B climbed higher but not higher. I  
mean its higher but it didn't climb  
more feet because it was already  
higher. It didn't grow more. Its  
just higher. It seem like A grew  
more even though it didn't grow  
higher than B.

Pete

B grew more because it grew  
to 16'. That's more than A  
grew.

1. Carefully read the sample student responses making sure you understand the student's thinking. What are some things you notice about each? Jot down your thoughts.
2. Is there anything mathematically incorrect in the reasoning of each student?
3. Discuss your findings with people at your table.

## Absolute and Relative reasoning

There is more than one way to think about a comparison. You have just seen two types of thinking. One uses **absolute reasoning**, which refers to a quantity by itself, without respect to its relation to other quantities. In contrast, the other uses **relative reasoning**, which compares that quantity to the originals to see how they relate to one another. We can relate these two types of reasoning to operations: *absolute thinking is additive, while relative thinking is multiplicative*.

Proportional reasoning is the major type of relative/multiplicative thinking introduced in upper elementary and middle school. Unfortunately, there is often little to no understanding of proportions developed by the time students start high school.

1. Which type of reasoning did you use to answer the first question about the trees (before picture: which tree is taller?)
2. Think back at your answer to the second question (after picture: which tree grew more?) Which type of reasoning did you use for that question?
3. Look back at the student work and classify the reasoning of each student.
4. Discuss your findings with others at your table and be ready to share with the whole group.