

Puzzle #88: Shop talk!

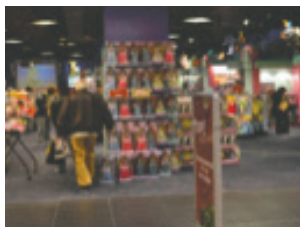
MoeZone

Real challenges for people living in the real world



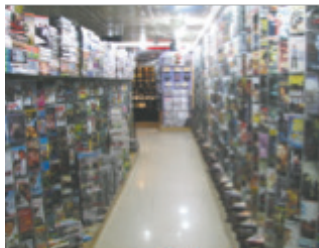
Be safe!

Can you get hurt?
Can someone else get hurt?



Go to your favorite store and see if you can estimate how many different items are in the store. Do you think your number is exact or how close to the real number is your estimate?

ELEMENTARY



I was in Target the other day and wondered how much money do they have in inventory just in the shampoo aisle. Make an estimate of how much you think is there!

ADVANCED



Estimate the total inventory value on the shelves at your favorite store. How did you come up with your number? How close do you think you are to the true value?

PROFESSIONAL

Send any solutions by Feb. 18, 2018, to Moe Benda at mbenda@d.umn.edu.

Best solutions and next puzzle will appear in HTF on Feb. 23, 2018.

Moe's quote:

The best time to plant a tree is 20 years ago.

MoeZone Puzzle #87 solutions: Just breathe!

ELEMENTARY PUZZLE

What is the oldest tree you have seen? Where is it and how did it get to be so old?

Carol (11, Lakeland): My mom and I hiked up near Canada and we had to get an Ojibwe guide to bring us to it, but we saw the Witch Tree on Lake Superior! It was growing right out of a rock—it was pretty cool! They said it may be more than 300 years old.

Moe's note: Carol, That's awesome! It's amazing to think that the Witch Tree was there before the U.S. became the U.S.! I did a quick Internet search and found some even older trees. Visit <http://mentalfloss.com/article/29879/6-oldest-trees-world>.

ADVANCED PUZZLE

We need to breath in oxygen and breath out carbon dioxide, while trees "need" the opposite. How many trees do you think each of us needs to be in balance?

I didn't know how much oxygen trees produced, so I did a quick search and, in fact, the number isn't easily found because it depends on many factors. The type of tree, its size, etc. But, I found a few consistent estimates. A good tree generates about 600 pounds of oxygen per year. So now, how much do we breath in? Again, it depends. Like trees, we are all different. But estimates are that we need about 130 gallons of oxygen each day or about 630 pounds of the element per year.

Moe's note: I like the math: 1 person, 1 tree!

PROFESSIONAL PUZZLE

Having a campfire/bonfire produces greenhouse gases. How much do you generate with a campfire/bonfire compared to driving a car?

Say you're burning maple, it's 40 lbs/ft³, where pine is about 22—much lighter and less carbon per log. A cord of wood is 128 ft.³. So let's say we're having a nice campfire and we burn about 1/16th of a cord of maple. That would be 2'x2'x10' of wood, or 320 pounds of maple. One pound of wood has about half a pound of carbon (an estimate) but C turns to CO₂ when it burns, so one pound of carbon in the wood would turn to 3.7 pounds of CO₂ by adding the oxygen: 320*3.7 is 1173 pounds of CO₂. How about cars? Gasoline is a mix of many different length hydrocarbons, but let's use hexane as our model, C₆H₁₄. According to the U.S. Energy Information Administration, burning one gallon of gasoline generates 20 pounds of CO₂. A car that gets 50 miles per gallon of gasoline could drive almost 3,000 miles.