

## Math magic! (STEM Principle: Math)

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Math isn't just for class! Adding, multiplying and dividing can keep the mind going if you hit a boring spot on the trail. (It happens – kids tend to get bored before they get tired, so be ready with some mental exercises.) Even young kids can begin tackling word problems, and you don't need paper or pencil. Just talk to each other. They'll soon find out all kinds of things about the world around them using some simple mental math. With just these tools, you and your little ones can learn how to use skills like **estimation** and **averages** to learn about the hike!

**Estimation** is a big word that means that we're guessing how many we have of something when there's too many to count. If you tried to count all the rocks on the beach, you'd be there all night! Instead, we count very few things and group them in sets, so we can guess how many there are when you put the sets together.

**Averages** use sets of numbers to find out the most common amount. So, if most of the trees in the forest had four branches on them, you would say that “the average tree has four branches.” But how do we come up with this magic number, and how can we use it?

First, find enough small rocks, pinecones, sticks or whatever else you can find lots of to make some small piles of them – **8** piles is fine but you can do more if you want to. It's best if the piles are different sizes. Now, ask the kids to count how many rocks are in the first four piles. Record each number, and add them together. So, if your four piles had **8**, **6**, **11** and **7** rocks in each of them, you would add **8 + 6 + 11 + 7** to get **32** rocks total.

Divide this number by four. Because you are dividing the total amount by the number of piles, you get the number of rocks in the “average” pile. In this case, we **divide 32 by 4** to get **8** rocks per pile. Now that you know how many rocks are in the average pile, you can multiply by the number of piles you have to make an estimate of how many rocks you have! So, if we have **8** piles, and there are **8** rocks in each pile, multiply those two numbers together to get **64 rocks!**

You can test your new skills by estimating things together. You could also apply this to figuring out how many steps it is back to the truck! Start with how many steps in 0.1 miles (this will provide good practice with place values, too!). Then figure out how far back to the truck (number of steps X tenths of a mile back). You may need to use your estimation skills for this challenge...