

Competition

- 1) You have 3 nickels, and 3 pennies. They are put on a 10x1 grid so that all of them are placed in neighboring squares at one end in alternating order.

For example:

Penny	Nickel	Penny	Nickel	Penny	Nickel				
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You can only move two neighboring coins at the same time without switching their order.

How can you move the coins in such a way that you will have 3 pennies on one side and 3 nickels on the other side in 3 moves?

- 2) You have 3 piles of toothpicks: one with 11 toothpicks, one with 7 toothpicks, and one with 6 toothpicks. Each turn you can move from one pile to another the same amount of toothpicks that already are in the pile to which you move the toothpicks. How can you get 3 piles of 8 toothpicks after three turns?
- 3) A group of kids from Kinawa Middle School went camping, and came to a river. There needed to cross the river, but the only thing they found was a small boat and two elementary school kids engaged in an intense chess game. Unfortunately only one kid or two elementary school kids can fit in the boat. How can all the kids cross the river? (You guys get to bully the little kids into helping you cross the river.)
- 4) You have 5 pieces of chain with 3 links in each. Breaking a link counts as one move, and mending the link back together also counts as one move. How can you make a 15 link long chain by only 6 moves?
- 5) A dog is running to catch a Frisbee at 3m/s. The Frisbee is flying in the opposite direction at 5m/s. a) How far are the dog and the Frisbee one second before the dog catches the Frisbee? b) How much time will pass between the time when the dog and the Frisbee are 1m apart and the time when the dog catches the Frisbee.
- 6) Harry Potter got scared of people impersonating him on Halloween, so he confiscated all the fake scars he saw. By the end of the night, Ron asked him how many scars Harry had collected. Harry said that he now has $\frac{3}{4}$ of the scars he collected plus $\frac{1}{4}$ of a scar. Ron was confused by this. Let's see if you are smarter than Ron. How many fake scars did Harry collect.
- 7) Billy was driving at the speed of 35m/s down the highway. Sally is driving in the same direction at the speed of 31m/s. If Billy passes by Sally in 2sec., how long is Billy's car?
- 8) There are 5 boys in a class. Each of the boys has 1 female classmate. How many people are in the class?
- 9) The average of 6 numbers is 7. A 7th number is added, and the average becomes zero. What was the seventh number?
- 10) Find all solutions $a; b; c; d; e$ if it is known that they represent distinct digits and satisfy the following:

$$\begin{array}{rcccc}
 & a & b & c & d \\
 + & a & c & a & c \\
 \hline
 c & d & e & b & c
 \end{array}$$