

Riddles

Upper Elementary

Troll Tolls (Whole-Class Activity)

You are on your way to visit Grandma, who lives at the end of the valley. It's her birthday, and you want to give her the cakes you've made. Between your house and her house you have to cross seven bridges, and there is a troll under every bridge! Each troll insists you pay a troll toll. Before you can cross each bridge, you have to give each troll half of the cakes you are carrying. However, as they are all kind trolls, they each give you back a single cake. How many cakes do you have to bring with you to make sure you arrive at Grandma's with exactly two cakes?

Where's the Nail?

Both ends of a string are nailed to a wall. The string is six feet long, and the center of the string dips down three feet from where each end of the string is nailed to the wall. How far apart are the two ends of the string nailed from each other?

Socks and Shoes

You are in a dark closet. On the floor there are six shoes of three colors (two of each color) and a heap of twenty-four socks, black and brown (twelve of each color). How many socks and shoes must you take into the light to be certain you have a matching pair of socks and a matching pair of shoes?

Playing Cards

There are three playing cards lying face up, side by side. A five is just to the right of a two. A five is just to the left of a two. A spade is just to the left of a club, and a spade is just to the right of a spade. What are the three cards?

River Crossing

A man needs to cross a river in a canoe. He also needs to transport a bag of grain, a chicken, and a fox across the river. He can only carry one of the three with him in the canoe at a time. If he leaves the grain and the chicken alone together anywhere, the chicken will eat the grain. If he leaves the chicken and the fox alone together anywhere, the fox will eat the chicken. How can he transport himself, the grain, the chicken, and the fox across the river without anything being left behind or eaten?

Coin Shuffle

Line up five coins in the following order: quarter, penny, quarter, penny, quarter. In three moves (a move consists of swapping two adjacent coins), rearrange the coins so the three quarters are together and the two pennies are together with no empty spaces in between each coin. At the end of each move, the coins are always in line as in the original configuration. That is, the coins must be in a line with no spaces between them after each move.

Pennies

Mary has a coin purse with fifty coins, totaling exactly one dollar. One of the coins is a quarter. What are the other forty-nine coins?

Middle School

A Liar and a Truth-Teller (Whole-Class Activity)

You are standing in front of two identical doors. Behind one of them is something good, and behind the other is something bad. You don't know which door leads to which. In front of the doors are two guards who know which door leads to the good thing and which leads to the bad thing. One of the guards always lies, and the other always tells the truth. You don't know which guard is the liar and which is the truth-teller. What question should you ask to find out which door leads to the good thing?

Milk Jugs

A milkman has two empty jugs: a three-gallon jug and a five-gallon jug. How can he measure exactly one gallon without wasting any milk?

Monkey Mayhem!

Three humans, one big monkey, and two small monkeys need to cross a river, meeting the following conditions:

- *Only humans and the big monkey can row the boat.*
- *At all times, the number of humans on either side of the river must be greater than or equal to the number of monkeys on that side (or else the humans will be eaten by the monkeys).*
- *The boat only has room for two (monkeys or humans).*
- *Monkeys can jump out of the boat when it is banked; that is, a human can drop off a monkey without getting out of the boat and risking being eaten.*

Apples and Oranges

There are three covered baskets. One contains only apples, one contains only oranges, and one contains a mixture of both. The baskets are labeled, but they are all labeled incorrectly. You must determine the true contents of each basket, but you can reach into only one basket and take only one piece of fruit. Which basket do you reach into, and how does that tell you the contents of all the baskets?

The Hat Game

Four men are given hats to wear. There are two black hats and two white hats, and the men know this. The first man is behind a screen and cannot see or be seen by anyone else. The second, third, and fourth men are lined up so the second man can see no one, the third man can only see the second man, and the fourth man can see both the second and third men. They are not allowed to talk to one another, and no one can see the color of his own hat, but each is instructed to try to figure out the color of his hat. A minute goes by, and no one calls out. Then, one of the men correctly calls out the color of his own hat. Which man was it?

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Twelve Marbles

You have twelve marbles that are identical in size, shape, and color, but one of them weighs slightly more than the others. You need to determine which single marble is heavier in weight than the others. You are supplied with a balance (two pans on opposite sides of a fulcrum; the side with heavier things in it will tilt lower than the other side), but you can only use it three times. How can you figure out which marble is heavier?

High School

Night Crossing (Whole-Class Activity)

Four people need to cross a dark river at night. They have only one flashlight and the river is too risky to cross without it. If all the people cross simultaneously, the light will not be sufficient—only two people can cross at the same time. The speed of each person crossing the river is different. When two people cross together, they travel at the speed of the slower person. Each of the four people takes one minute, two minutes, seven minutes, and ten minutes to cross, respectively. What is the shortest time needed for all four people to cross the river?

Weight Watch

There are three machines designed to produce one-ounce ball bearings. However, one machine is defective and produces 1.1-ounce ball bearings. Each machine has a cup of ball bearings that it produced sitting in front of it. You may take any combination of ball bearings from these cups (for example, you can take one from each cup, three from one cup, two from one cup, or none from a cup, and so on). Once you select a combination of ball bearings, you can weigh that combination once on a scale. What combination of ball bearings should you select to weigh to figure out which machine is defective? Keep in mind that you select one combination of ball bearings and weigh it once; you do not get to choose multiple combinations or weigh multiple times.

Heads and Tails

There are twenty coins sitting on a table. Ten are turned so the heads side is facing up, and ten are turned so the tails side is facing up. You are sitting at the table with a blindfold and gloves on. You are able to feel where the coins are but are unable to see or feel if they are heads or tails. You must create two sets of coins. Each set must have the same number of heads and tails as the other group. You can only move or flip the coins, but you do not know which coins are currently heads up or tails up. How do you create two even groups of coins with the same number of heads and tails in each group?

Cards in the Dark

You are standing in a completely dark room. A friend walks up and hands you a normal deck of fifty-two cards. He tells you that thirteen of the fifty-two cards are face up, and the rest are face down. These face-up cards are distributed randomly throughout the deck. Your task is to split up the deck into two piles using all the cards, so each pile has the same number of face-up cards. The room is completely dark, so you can't see the deck as you do this. How can you accomplish this seemingly impossible task?