

The strange ice-cream flavor

The twins Tim and Tom have an ice-cream shop together. Tim has made a new flavor *chocolate banana*, which tastes good. Tom has made a new flavor *chocolate cheese* which tastes, well, less good.

They decide to test the two new flavors one day at the shop, adding them to the usual assortment. At the end of the day, Tom is enthusiastic because in their notes they have marked that 5 kids did not like the *chocolate cheese* while 10 kids did not like the *chocolate banana*, which clearly means that his flavor is better.

Tim is perplexed but then he understands the situation more clearly. Only 5 kids have tasted the *chocolate cheese* and all of them have disliked it, while 20 kids have tasted the *chocolate banana*. So many kids like his flavor and it can be kept, while they should completely forget the *chocolate cheese* attempt.

Key takeaway: Numbers can be big or small, but their comparison must be put into context.

The very dangerous substance DHMO

On social media, you find a group of people that ask to ban the chemical element Dihydrogen Monoxide DHMO. They say that such a chemical element can be really dangerous for health and for the environment: a certain type of exposure to it may have fatal consequences. In a nutshell, DHMO causes everywhere in the world, on a daily basis, damage to people and animals.

You ask your science teacher to confirm what is written, and she indeed confirms the facts. However, she discourages you from supporting the ban, despite all the evidence that shows that DHMO is dangerous. Indeed, your science teacher tells you that DHMO is made from oxygen and hydrogen and that the common name for that chemical is: water. The facts are true because water can indeed be very dangerous, just think of a stormy sea.

Key takeaway: Nothing is black or white, and scientific facts can be used (in a non-scientific way) to turn light grey into black or dark grey into white.

One point of view

You have many friends who play football, and many people of all ages play or like football, that is clear to everyone. However, you read in a survey conducted interviewing 100 kids that very few of them like football or play football. They prefer other sports. How can this be possible? Is there anything funnier than running after a ball?

The survey was conducted at a sport event and shows unmistakably that the kids like all kinds of sports: basketball, judo, swimming, gymnastics, tennis, ... However, none of the kids gives football as their favorite sport, despite there being girls and boys of different ages.

The date of the event catches your attention: it was last Sunday afternoon, parallel to the big football match in town: there is where all the kids who adore football went!

Key takeaway: The answers you may collect may stem from a special category and could let you forget about the other categories.

DATA SCIENCE STORIES

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REFERENCES

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The statistical riddle is inspired from *Il venditore di sogni a buon mercato*, in *Le streghe di Bayes e altre storie*, R. Camporese, S. Da Valle, S. Letardi, S. Osti and S. Peddes, Istat 2017.

The very dangerous substance DHMO

The website on DHMO is <https://www.dhmo.org/facts.html>

One point of view

The riddle is inspired from the historical account on *Abraham Wald and the Missing Bullet Holes*, taken from the book *How Not To Be Wrong* by Jordan Ellenberg, Penguin Group, 2014.