

Asteroid odds of hitting Earth double

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Impactful: New calculations suggest that the large asteroid approaching Earth might now miss our planet completely, and instead collide with the Moon.

Can numbers lie? If you read the above headline and drew a sharp inward breath, try to calm down. Earth is not about to descend into flames — the statistics are just lying to you.

What's happening?

Imagine that you have a one in 43 chance of winning £10,000 on the lottery. Do you bother buying a lottery ticket?

Now, imagine that you are at the airport, and you are told that your flight has a one in 43 chance of crashing and killing everybody onboard. Do you get on the plane?

Faced with a small probability of something good happening, most of us are not too bothered. But a small probability of something bad happening sparks instant panic.

Find out more

Now consider this: right now, an **asteroid** named 2024 YR, currently around 30 million miles away, is hurtling towards us through space.

On 22 December, 2032, it will either glide past Earth without incident, or crash into our planet at a speed of around 38,000 miles per hour. There is a one in 43 chance that it will hit us. How worried do you feel?

Statistics can be misleading.

In the Middle Ages, Europeans believed that lice were beneficial to health. Because sick people rarely had lice, they thought lice were protecting people

from illnesses. A classic confusion of **correlation** with **causation**.

In 1999, British woman Sally Clark lost two babies to sudden infant death syndrome (SIDS), a rare condition where infants die in their sleep.

Clark was convicted of murder and she spent more than three years in prison. Experts said the likelihood of two infants from the same family dying of SIDS was one in 73 million.

The reality was that Clark was just extremely, tragically unlucky and did not kill her babies.

Can numbers lie?

Some say

Yes! Statistics can easily be manipulated to support a specific argument. Selective use of data, misleading averages, logical fallacies and **biased** sampling can all be used to make numbers tell lies.

Others think

No! Numbers in most cases are neutral and **objective**. It is just a matter of maths. It is human behaviours, irrational as they are, that make it seem like numbers are lying.

Some people say

"Facts are stubborn, but statistics are more pliable."

Mark Twain (1835 – 1910), American writer, humourist and essayist

Empty heading

What do you think?

Six steps to discovery

1. Connect

How do you feel about this story? - Have you ever been misled by a statistic, or used one you knew was misleading? Do you think that numbers always tell the truth?

2. Wonder

What questions do you have? - For example: Why are humans sometimes irrational?

3. Investigate

What are the facts? - Flip a coin 10 times each and record your results. How likely would you say it is to flip heads 10 times in a row? If somebody flipped heads 10 times in a row, would you suspect them of cheating?

4. Construct

What is your point of view? - Make a claim. For example, Manchester United is the best team in the world. Now list some statistics to support your claim.

5. Express

What do others believe? - "Numbers never lie." Discuss in groups.

6. Reflect

What might happen next? - Imagine that it is 2032, and against the odds the asteroid has hit Earth and destroyed an entire continent. NASA did not bother to deflect it because the probability of it hitting us was too small. Write a short story about what has happened.

Glossary

Asteroid - A small body in space, made of metal and rock material. Asteroids usually orbit the sun, but if knocked off course they can be drawn into Earth's gravity and fall towards it.

Correlation - A connection between two things in which one thing changes as the other does, but it is not necessarily the case that one thing has caused the other to change.

Causation - The principle that nothing can happen without a cause.

Biased - Unfairly showing dislike or like.

Objective - Relating to external realities rather than internal states. The opposite is subjective. These are important concepts in philosophy but also notoriously hard to clearly define.