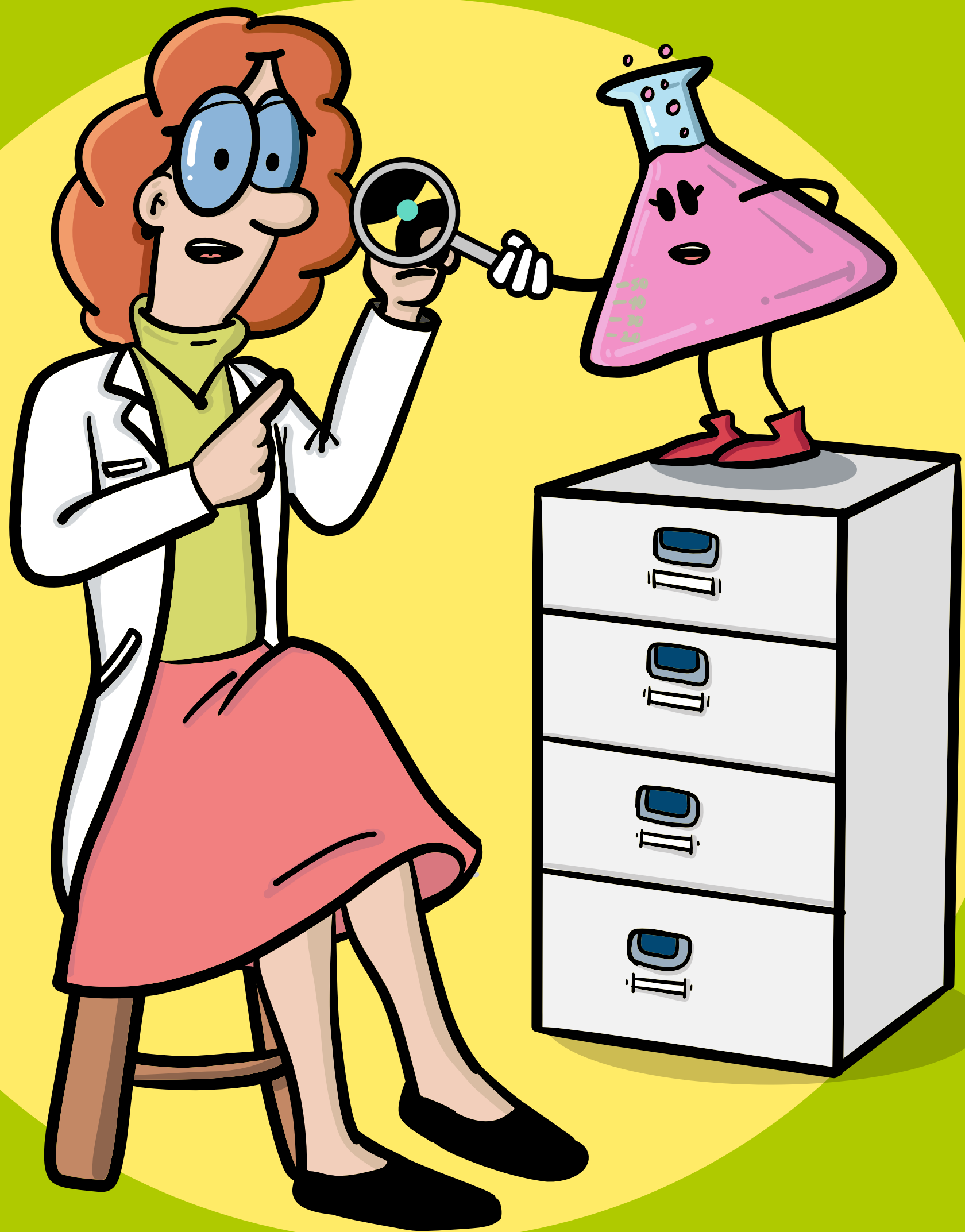


MICROPLASTICS

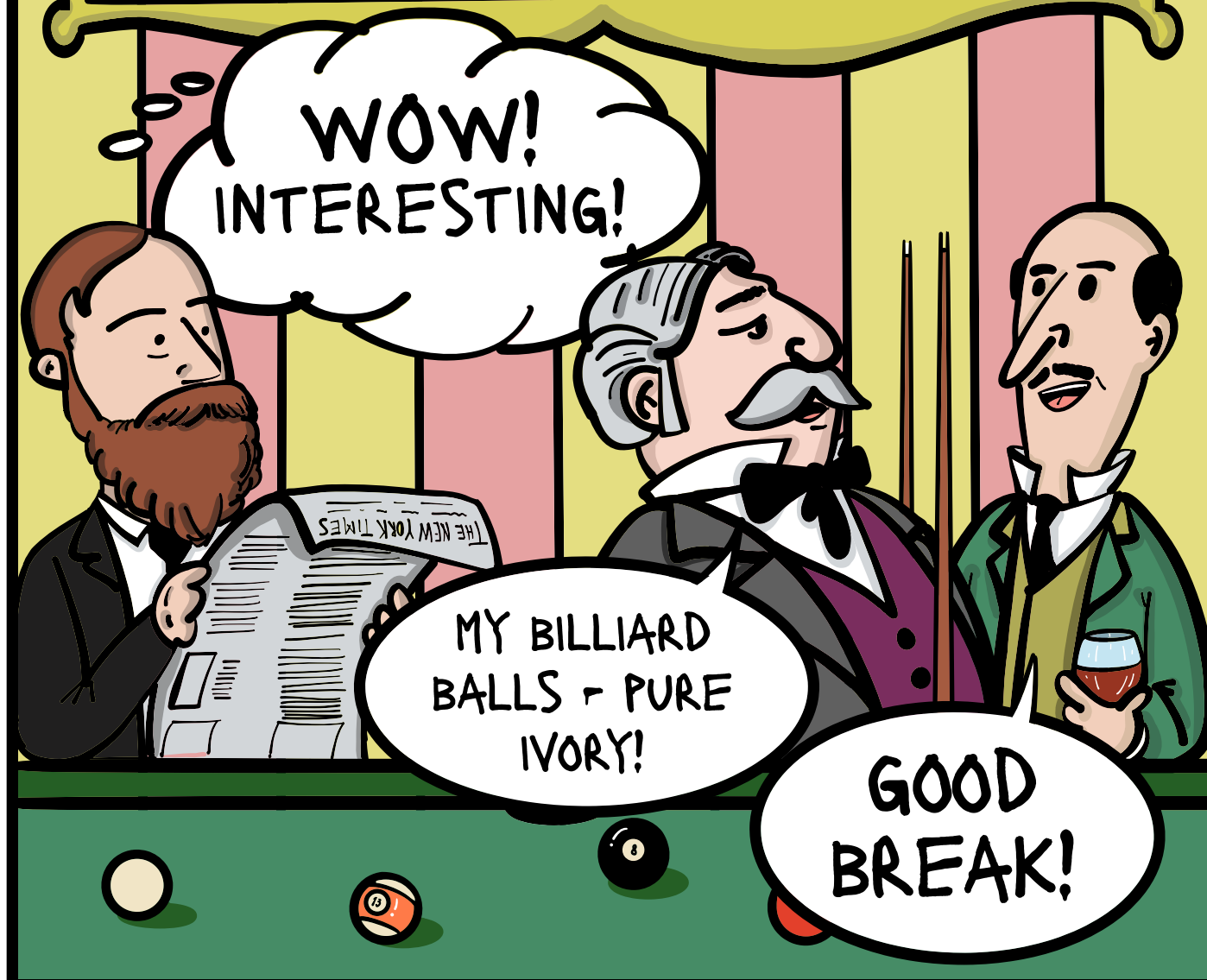
WHAT DOES
SCIENCE SAY?
THE BfR SCIENCE COMIC



'PLASTIC' ORIGINALLY
SIMPLY MEANT 'PLIABLE AND
EASY TO SHAPE'.
ONLY LATER DID IT BECOME A TERM
FOR MATERIALS WE TODAY
CALL POLYMERS ...



THE FIRST SYNTHETIC POLYMER
WAS INVENTED IN 1869 BY JOHN WESLEY
HYATT. A NEW YORK COMPANY OFFERED
\$10,000 FOR AN ALTERNATIVE TO IVORY ...



WOW!
INTERESTING!

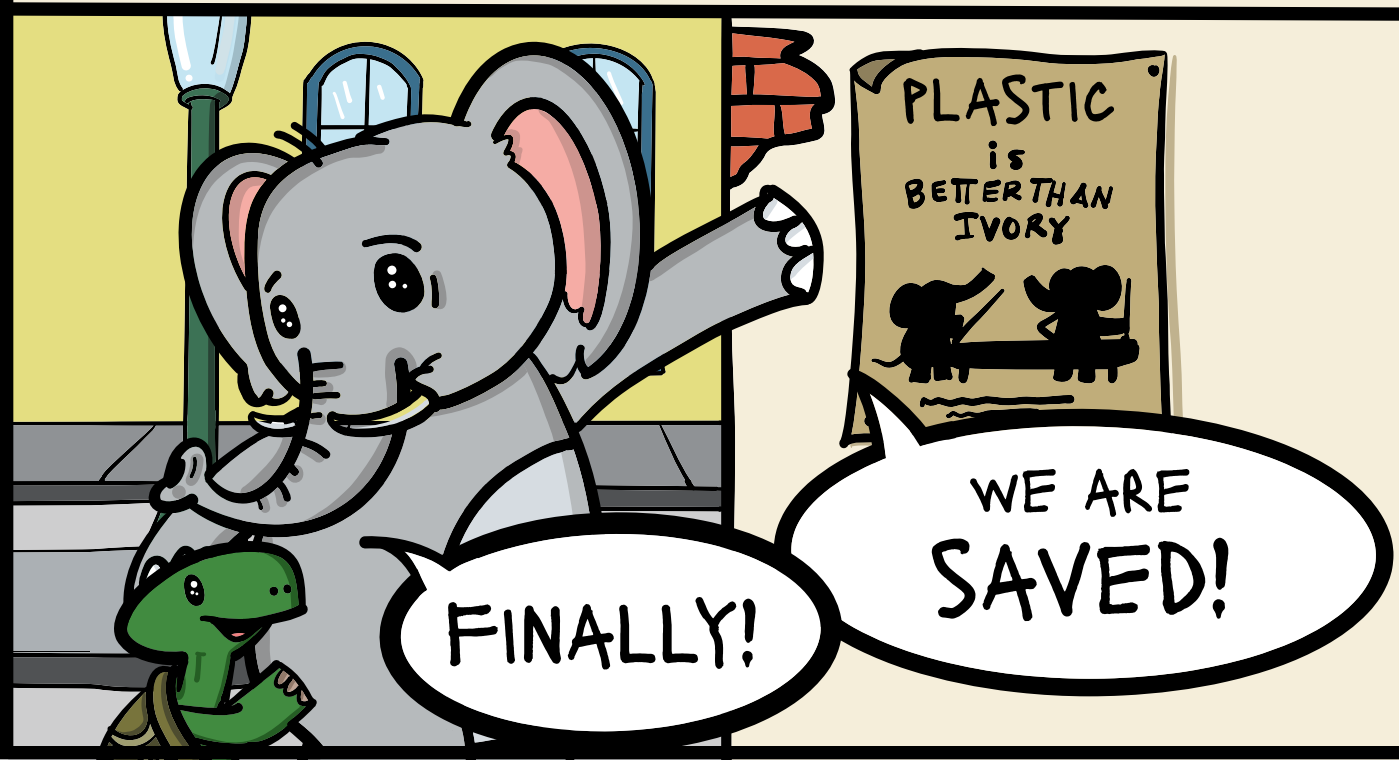
MY BILLIARD
BALLS - PURE
IVORY!

GOOD
BREAK!

BY USING COTTON CELLULOSE AND CAMPHOR,
HYATT DISCOVERED A MOULDABLE PLASTIC
THAT COULD IMITATE NATURAL SUBSTANCES
LIKE TORTOISE SHELL AND IVORY.



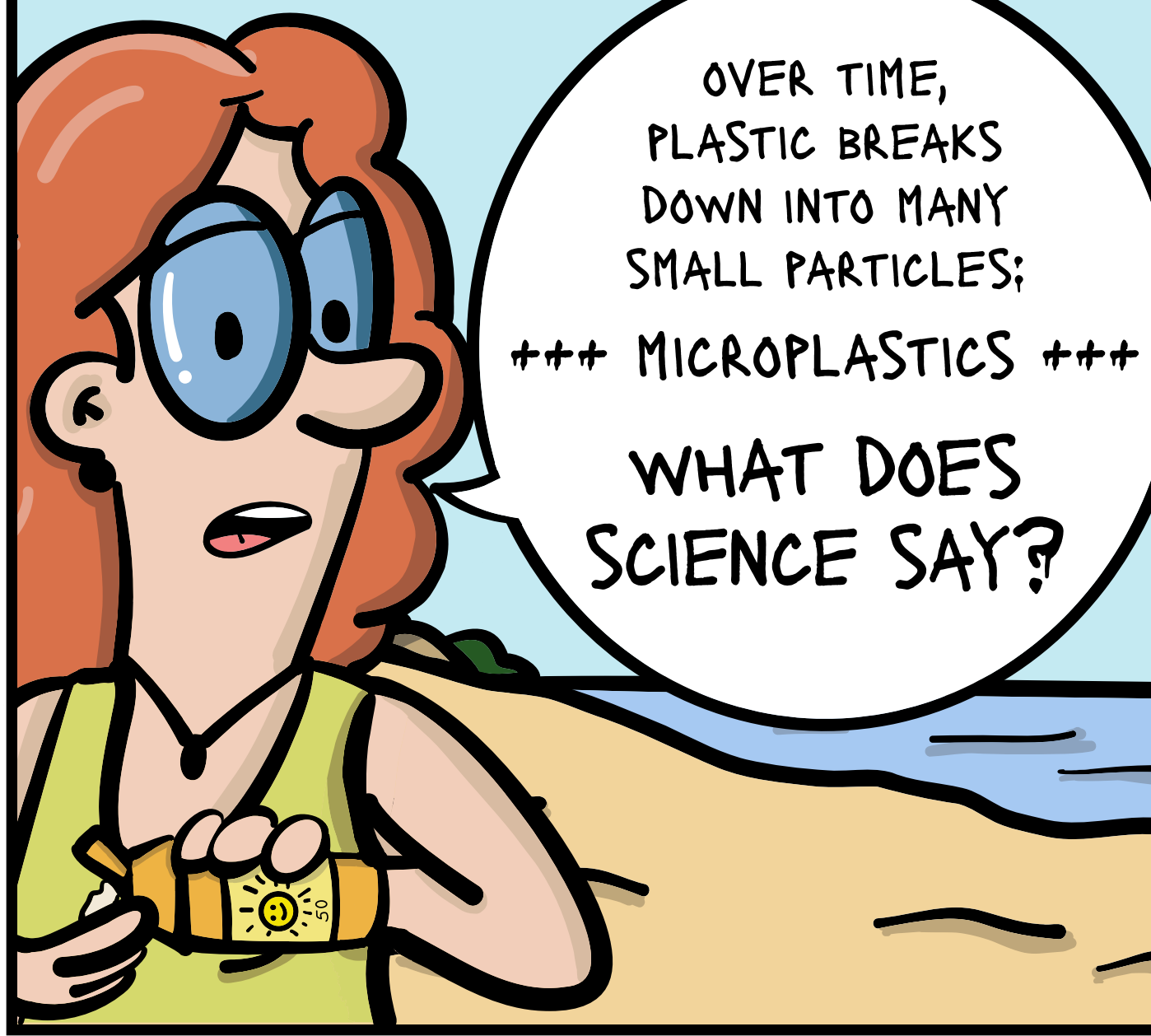
HIS DISCOVERY WAS CONSIDERED
REVOLUTIONARY AND WAS ADVERTISED
AS 'SALVATION OF THE ENVIRONMENT'.



FINALLY!

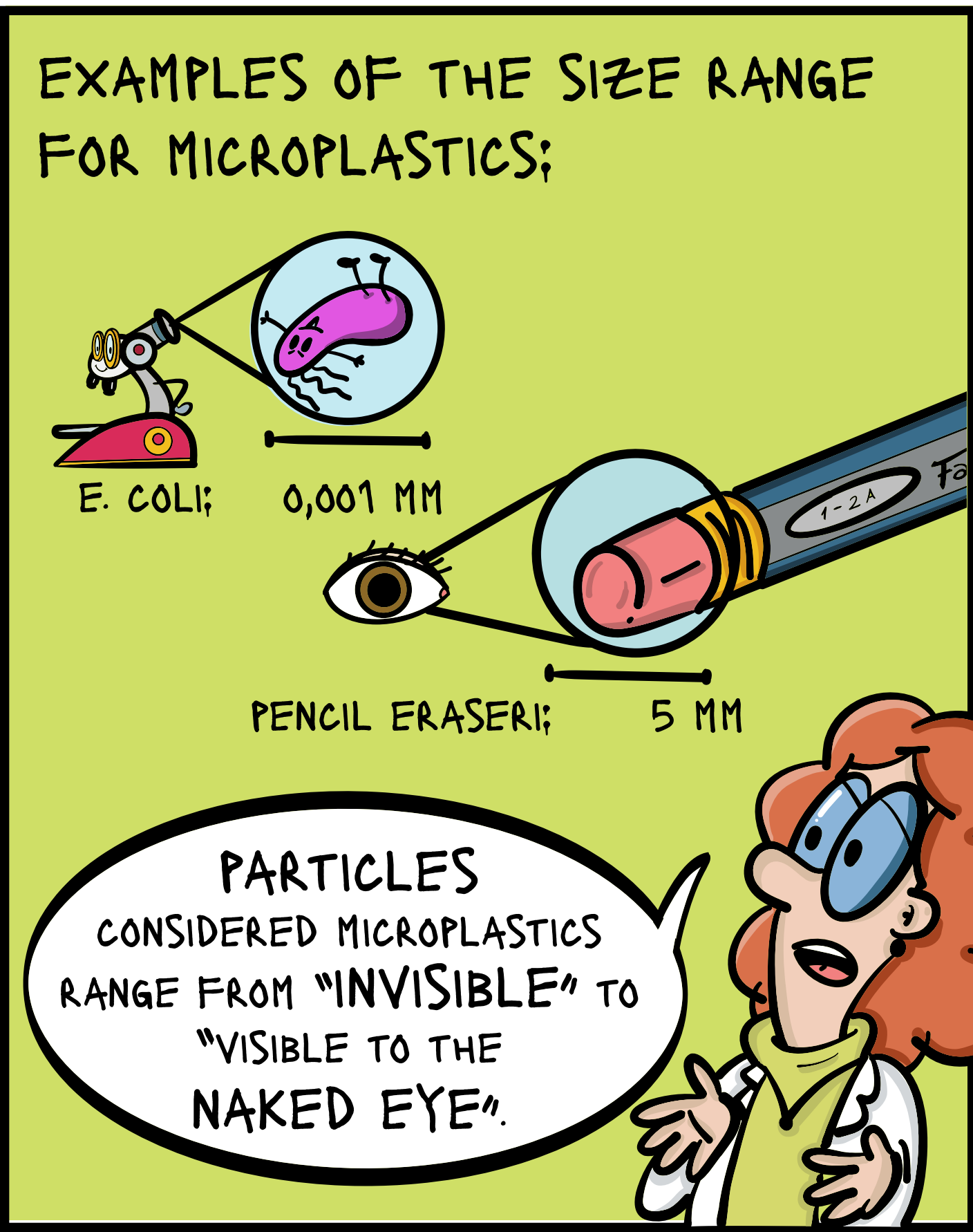
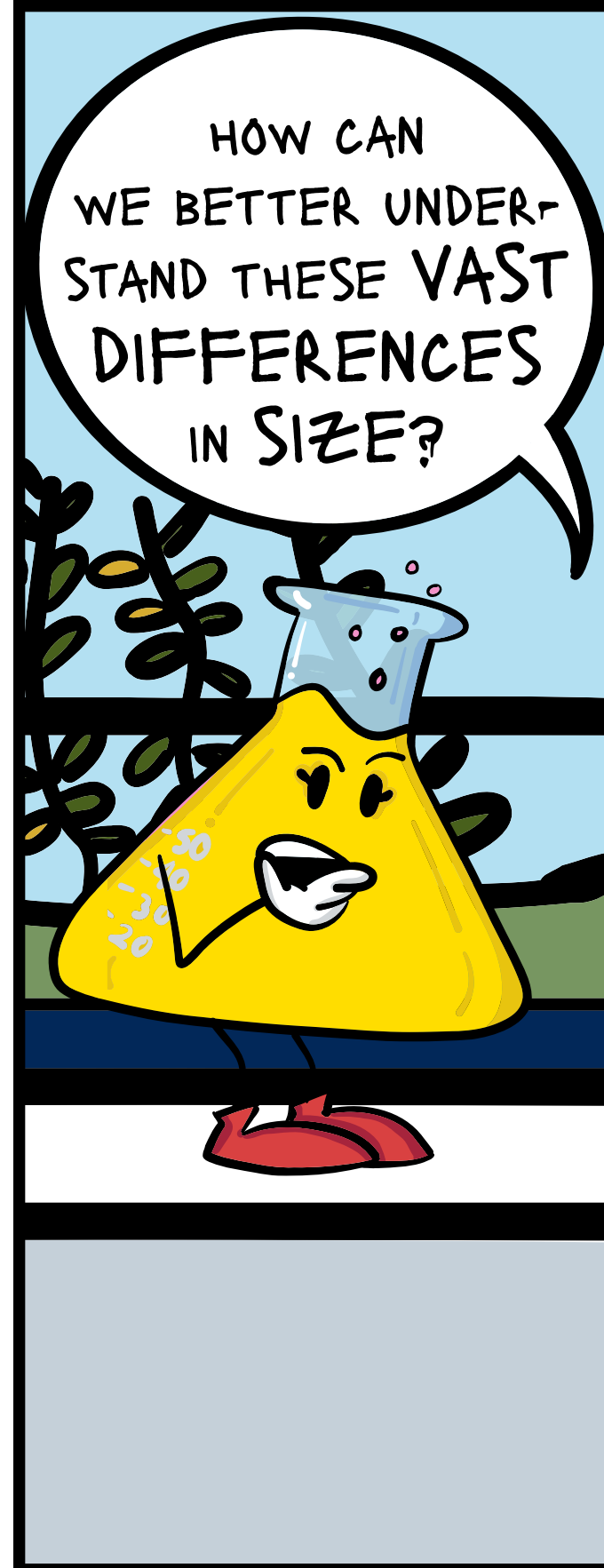
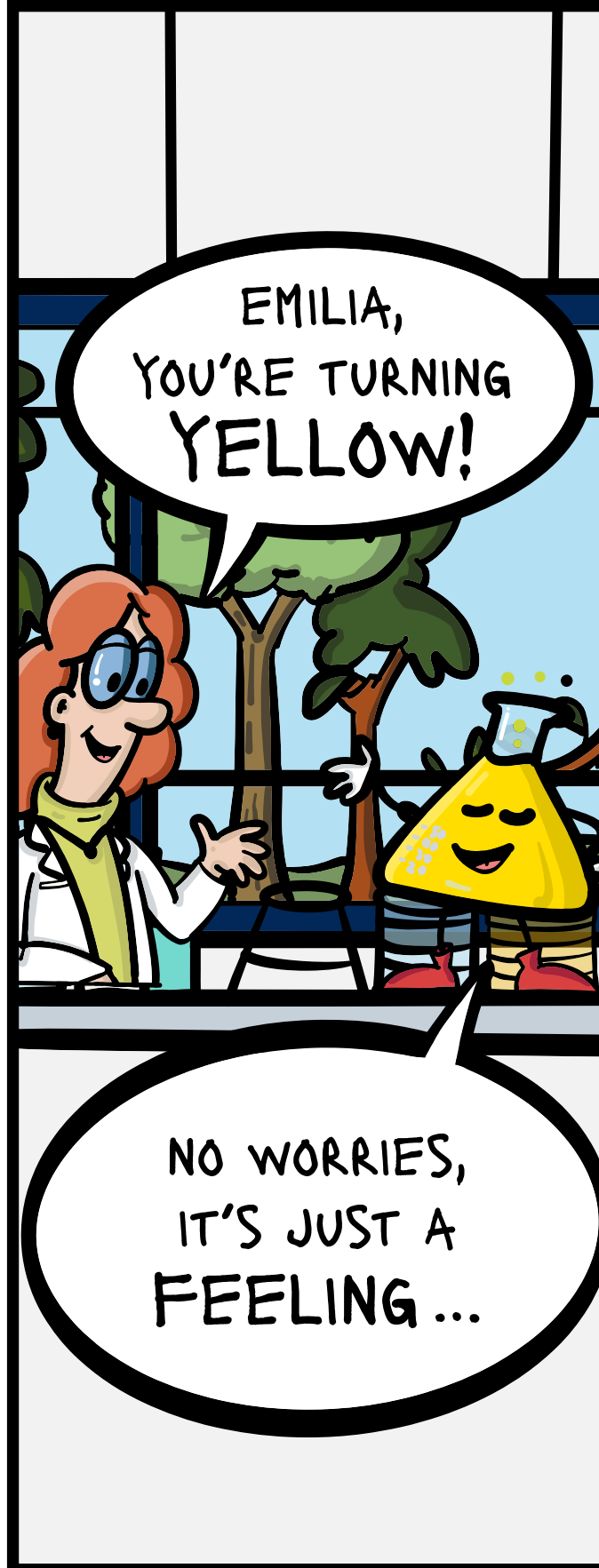
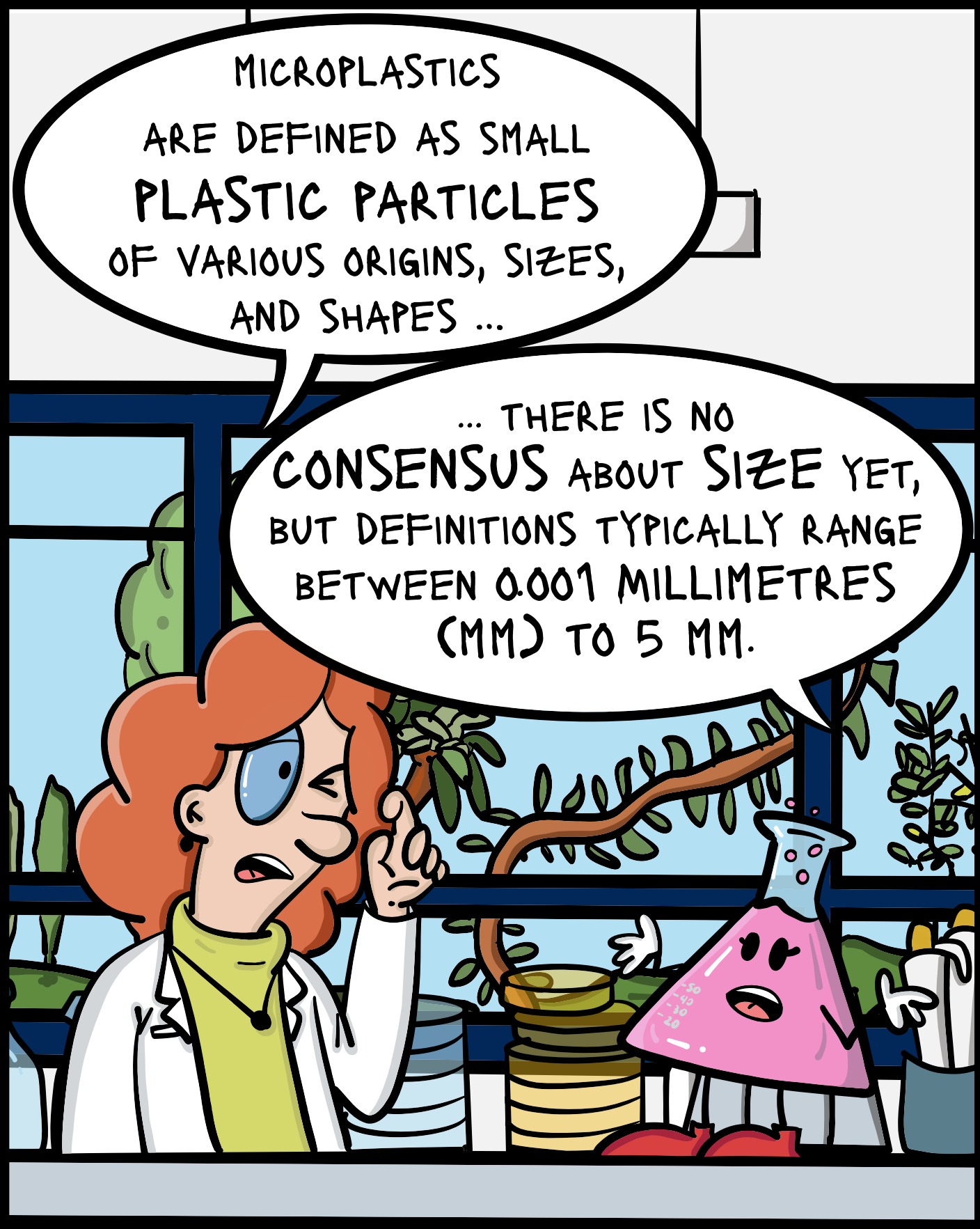
WE ARE
SAVED!

TODAY, WE SEE THINGS DIFFERENTLY.
WE NOW KNOW THAT PLASTICS IN THE
ENVIRONMENT ARE DEGRADED VERY
SLOWLY AND INCOMPLETELY.



OVER TIME,
PLASTIC BREAKS
DOWN INTO MANY
SMALL PARTICLES;
+++ MICROPLASTICS +++

WHAT DOES
SCIENCE SAY?



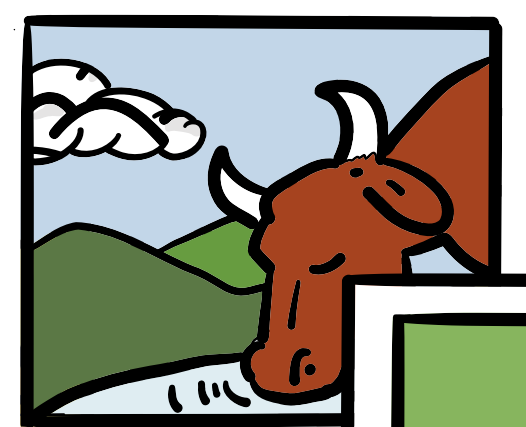
AND HOW DO
MICROPLASTICS
ENTER INTO THE
ENVIRONMENT?

WASHINGS,
FOR EXAMPLE;
THE ABRASION FROM CLOTHING
WITH PLASTIC FIBRES GETS INTO THE WATER
THROUGH WASHING. WATER TREATMENT
DOESN'T COMPLETELY FILTER THOSE
PARTICLES OUT OF THE WATER, SO THEY
RETURN TO THE NATURAL WATER
CYCLE, FOR INSTANCE THROUGH
AGRICULTURE.

OTHER EXAMPLES ARE THE DEGRADATION OF PLASTIC PRODUCTS
IN NATURE OR TYRE ABRASION.

WAIT A MINUTE,
IF MICROPLASTICS ARE
IN THE ENVIRONMENT,
CAN THEY END UP IN
FOOD?

WATER TREATMENT



WHAT WE KNOW SO FAR;
MICROPLASTICS ARE GENERALLY
TOO LARGE TO DISTRIBUTE
THROUGHOUT THE BODY AND
ARE TYPICALLY SIMPLY
EXCRETED.

AND WHAT ABOUT
NANOPLASTICS?
THOSE ARE EVEN
SMALLER,
RIGHT?

NANOPLASTICS ARE PARTICLES
BETWEEN 1 NANOMETRE AND
100 NANOMETRES.

THE TIP OF
A PENCIL MEASURES 1 MM.
IF YOU WERE TO PUT
1 MILLION PARTICLES IN THAT TIP,
EACH ONE WOULD BE
1 NANOMETRE.

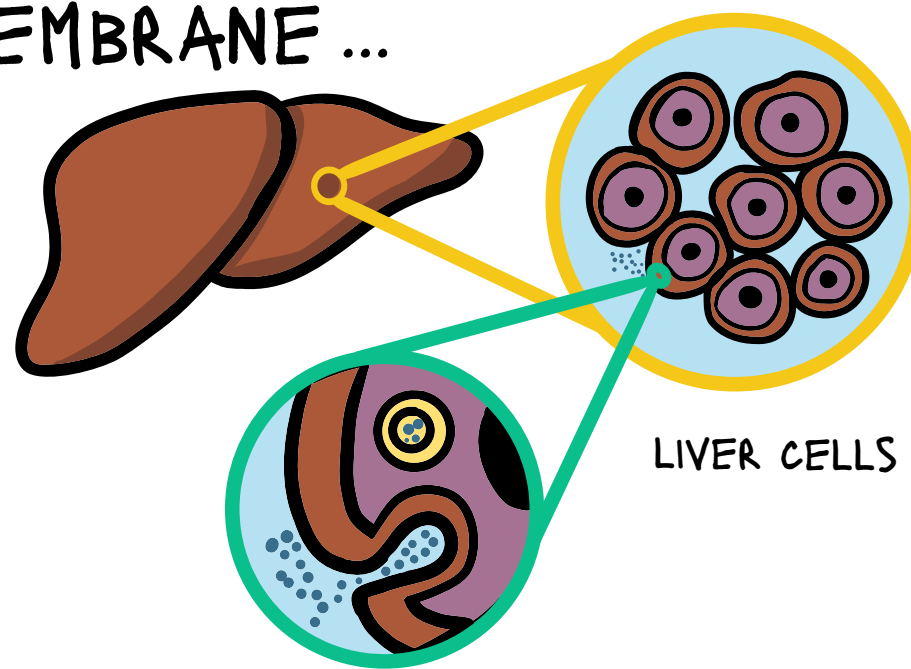
OMG!

**INTESTINAL
CELLS** ARE
NOT DAMAGED BY
NANOPLASTICS.

AHA?!

THE BFR HAS INVESTIGATED 'IN VITRO' HOW
NANOPLASTICS AFFECT CELLS. THIS WAS A
LABORATORY-BASED STUDY, WE CANNOT YET
SAY HOW AN ACTUAL BODY WOULD REACT.

IN THE LIVER, THE PARTICLES CAN BE
ENGULFED BY BEING ENCIRCLED BY THE CELL
MEMBRANE ...

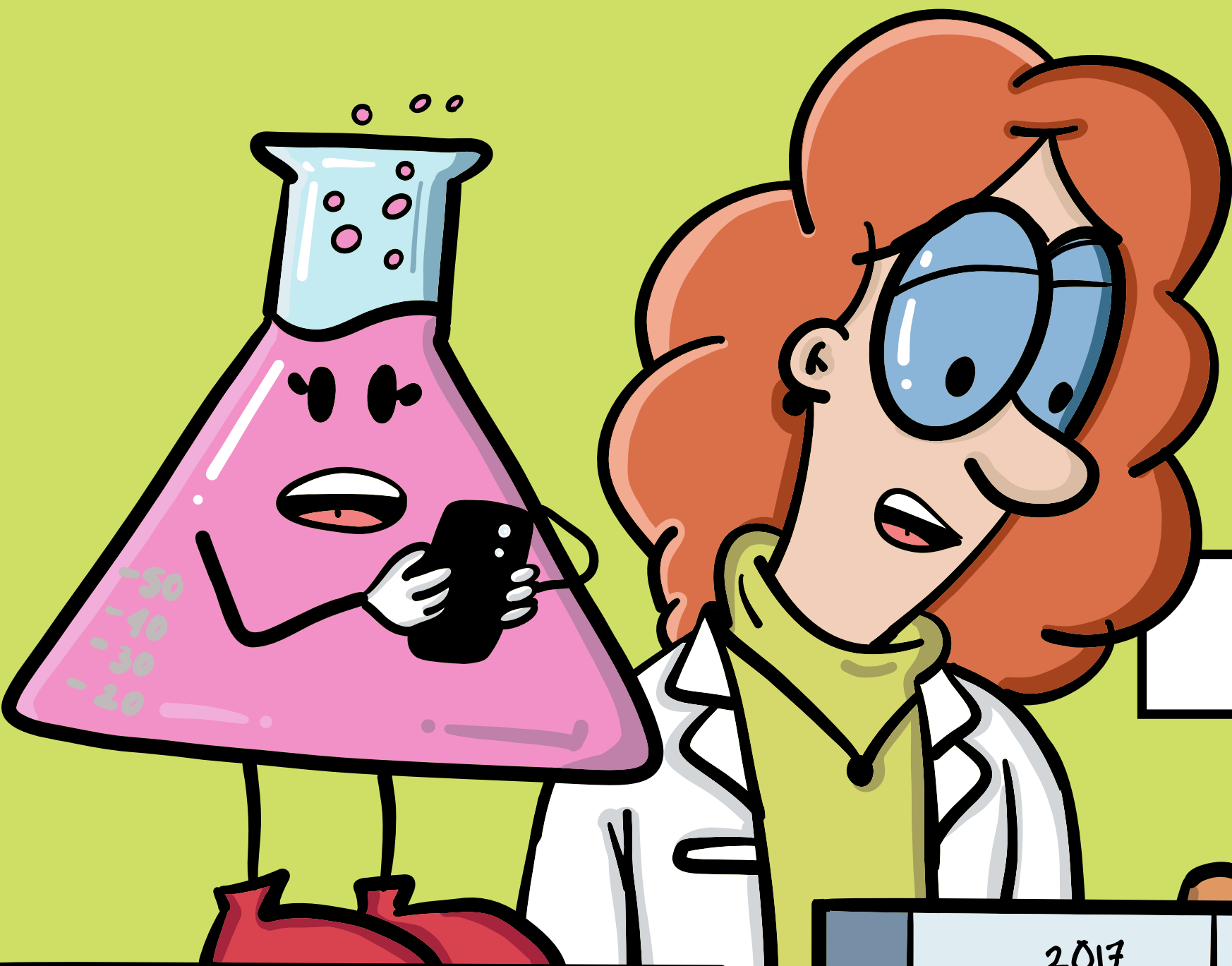


+++ WE CALL THIS ENDOCYTOSIS +++
HOWEVER, NO DAMAGING EFFECTS
WERE OBSERVED HERE EITHER.

ARE YOU PERSONALLY CONCERNED ABOUT MICROPLASTICS!?

CURRENTLY, THIS ISSUE IS ALL OVER THE MEDIA AND ON EVERYONE'S MIND ...

INDEED! AND THE RESULTS OF ANOTHER BFR SURVEY ON RISK PERCEPTION SHOW THAT CONCERN ABOUT **+++ MICROPLASTICS +++** IS INCREASING.

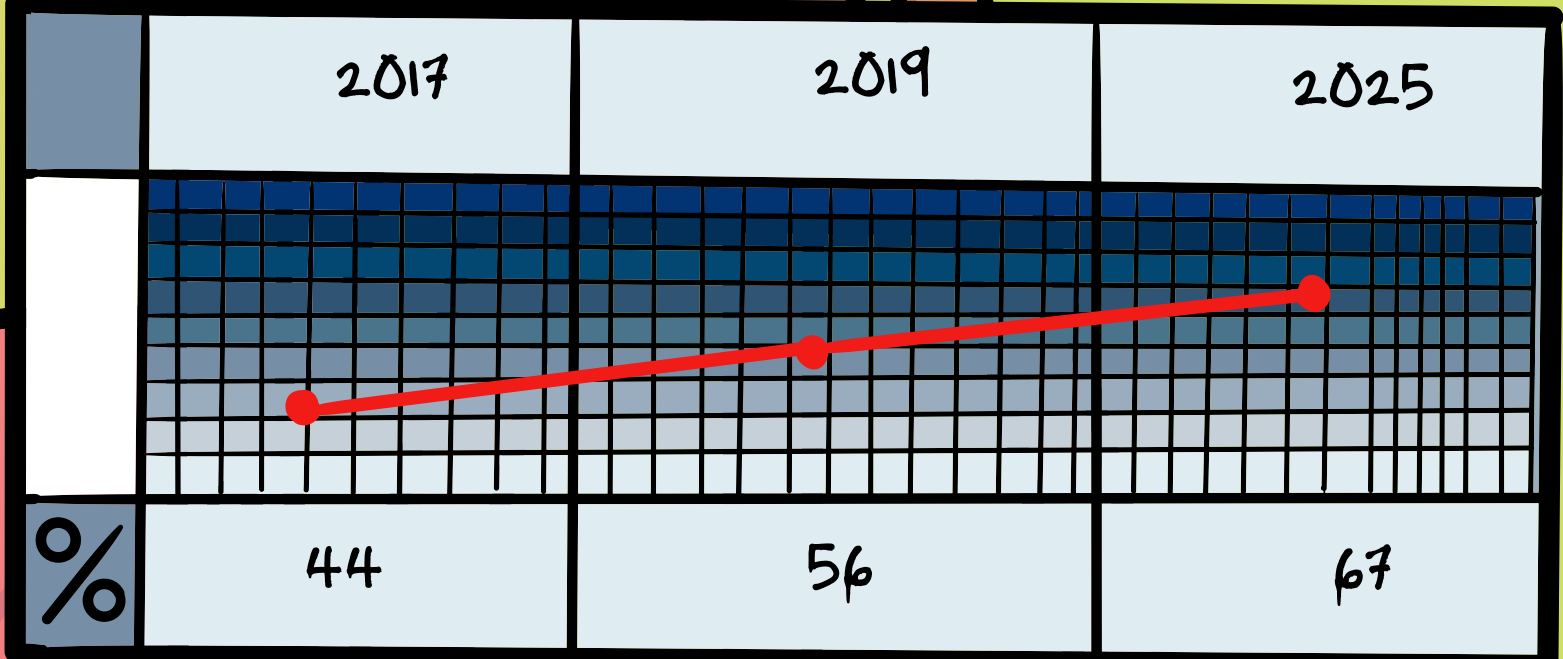


BFR SURVEY OVER 8 YEARS

WHEN PEOPLE WERE ASKED HOW WELL INFORMED THEY FELT ABOUT MICROPLASTICS IN FOOD,

36%

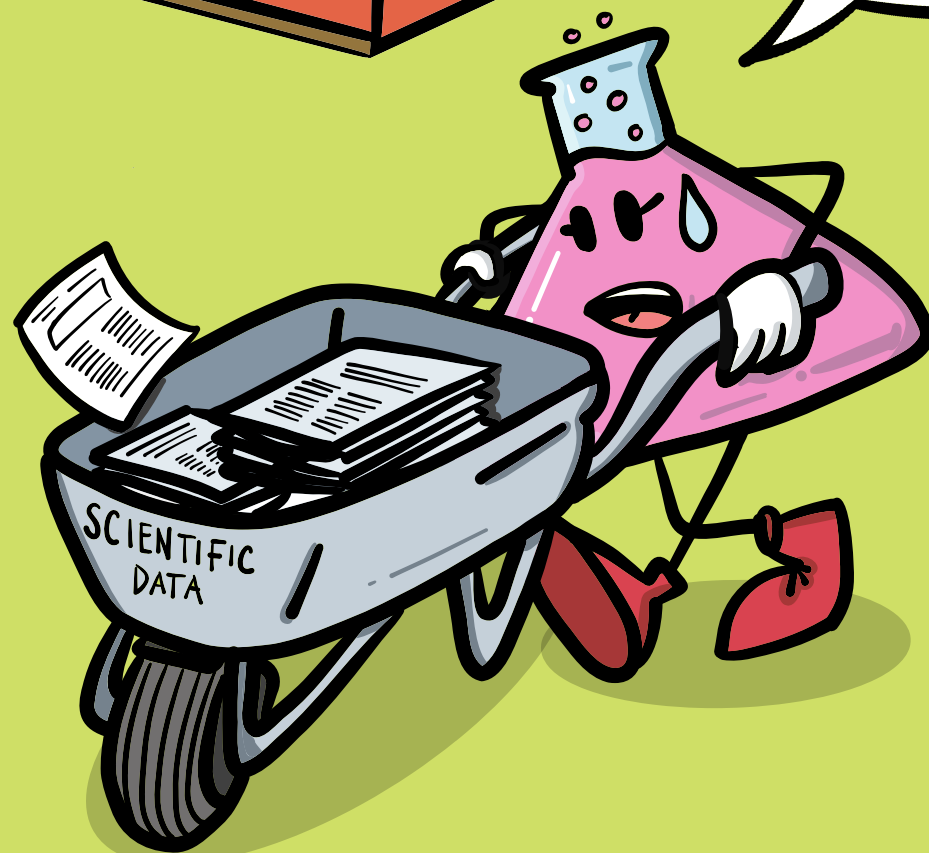
SAID THAT THEY WERE NOT WELL INFORMED OR HAD NEVER HEARD OF THIS ISSUE.



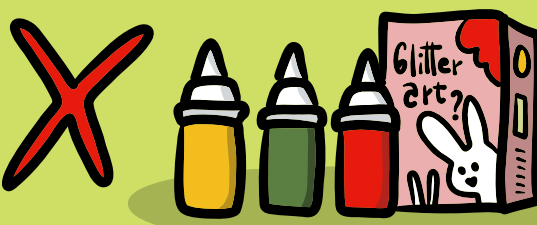
*SOURCE: BFR CONSUMER MONITOR 2017 / 2019 / 2025
NUMBER OF RESPONDENTS: 2017: 1,023 / 2019: 1,011 / 2025: 1,003
GERMAN SPEAKING POPULATION: AGED 14 YEARS AND OVER
IN PRIVATE HOUSEHOLDS IN GERMANY

DESPITE THE GAPS IN OUR KNOWLEDGE, THERE ARE ALREADY ENOUGH DATA TO START THINKING ABOUT REGULATIONS FOR MICROPLASTICS.

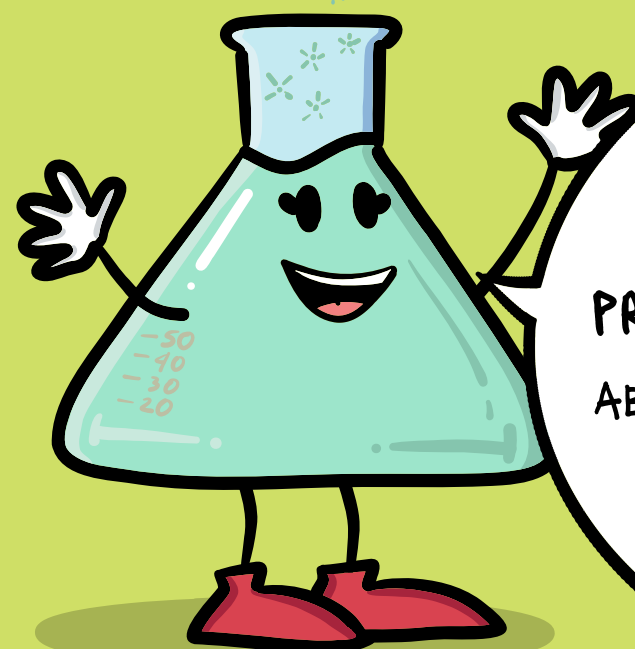
LOOK! THERE ARE STILL TWO DATA LOADS LEFT TO EVALUATE!!!



+++ MICROBEADS +++
IN COSMETICS, E.G. IN BODY SCRUBS, HAVE BEEN BANNED IN THE EU SINCE 2023.



THE SALE OF MICROPLASTICS, INCLUDING +++ PLASTIC GLITTER +++ ON THEIR OWN OR AS ADDITIVES IN PRODUCTS (E.G. CRAFT KITS, TOYS, ETC.) HAS ALSO BEEN FORBIDDEN.



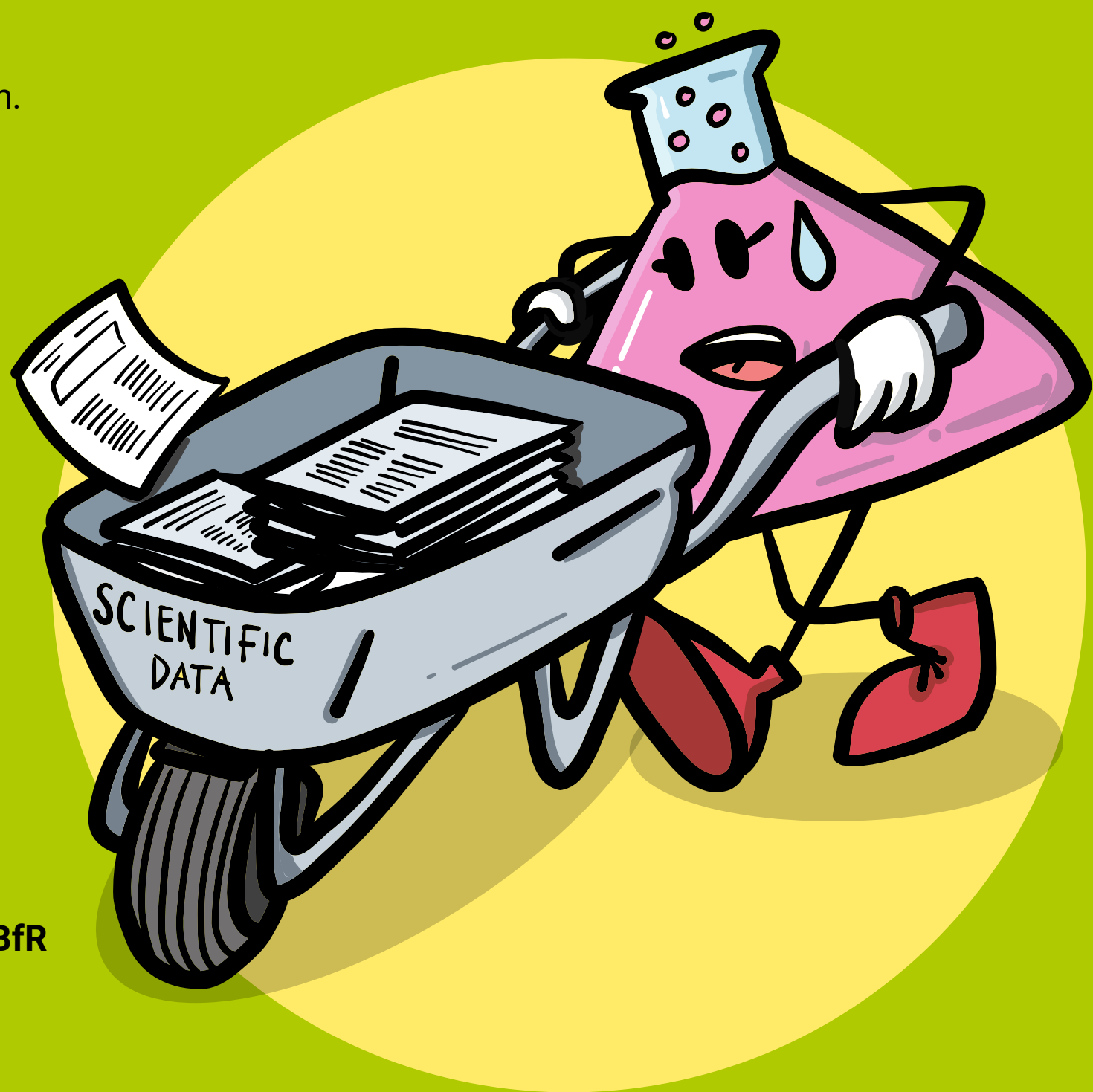
THESE RESTRICTIONS ARE EXPECTED TO PREVENT THE RELEASE OF ABOUT 500,000 TONNES OF MICROPLASTICS OVER A PERIOD OF 20 YEARS.

MORE RESEARCH IS NEEDED TO IDENTIFY THE HEALTH RISKS OF MICRO- AND NANOPLASTICS.

MORE INFORMATION;
WWW.BFR.BUND.DE/EN



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