TINKLE EXPLAINS

DIATOMS

Research
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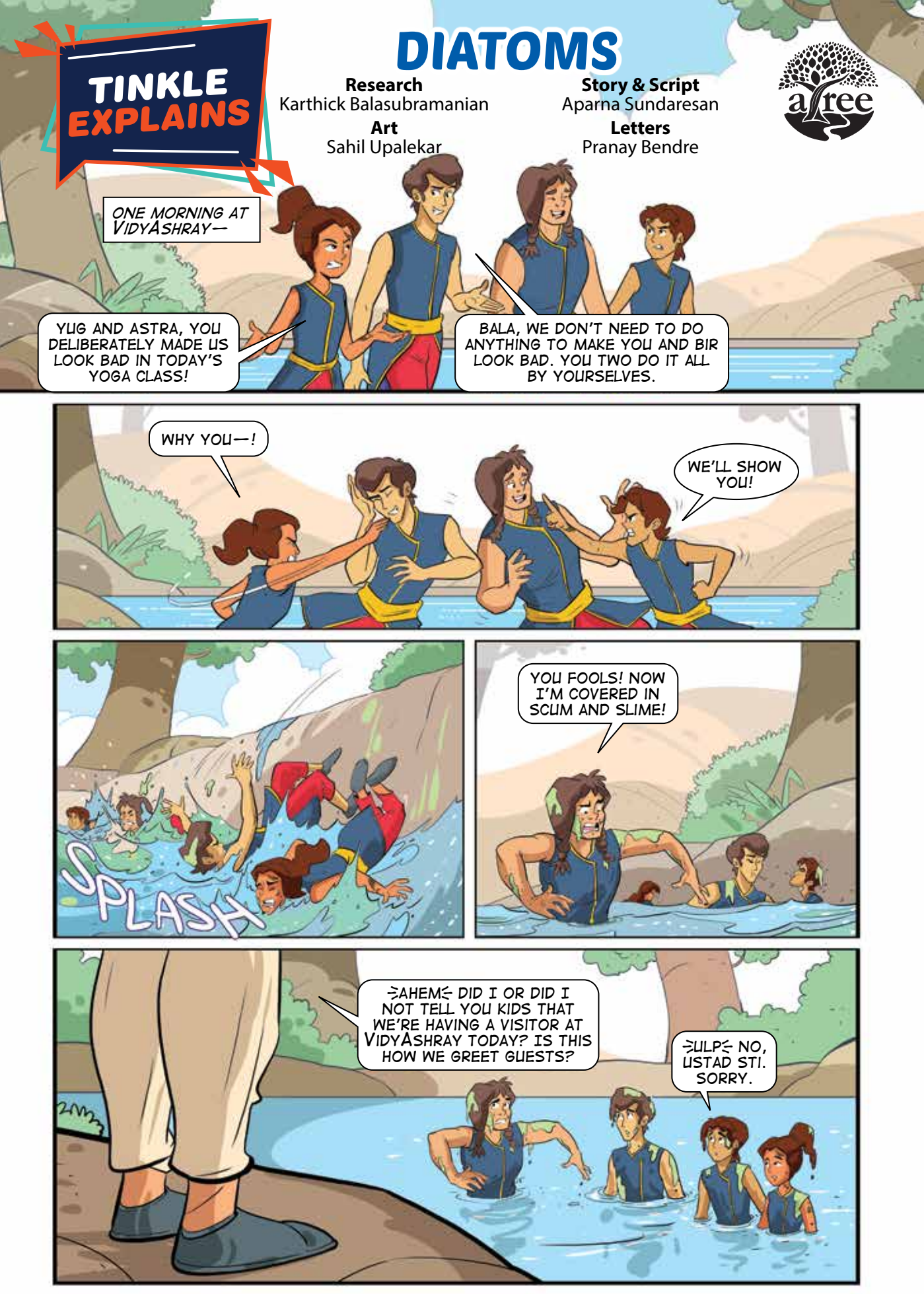
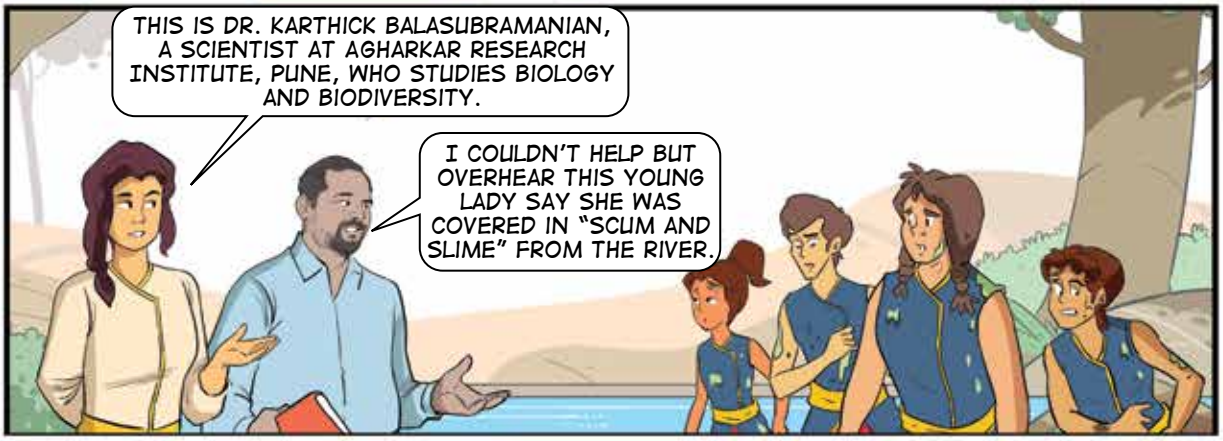
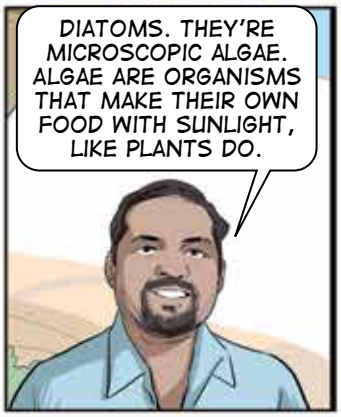
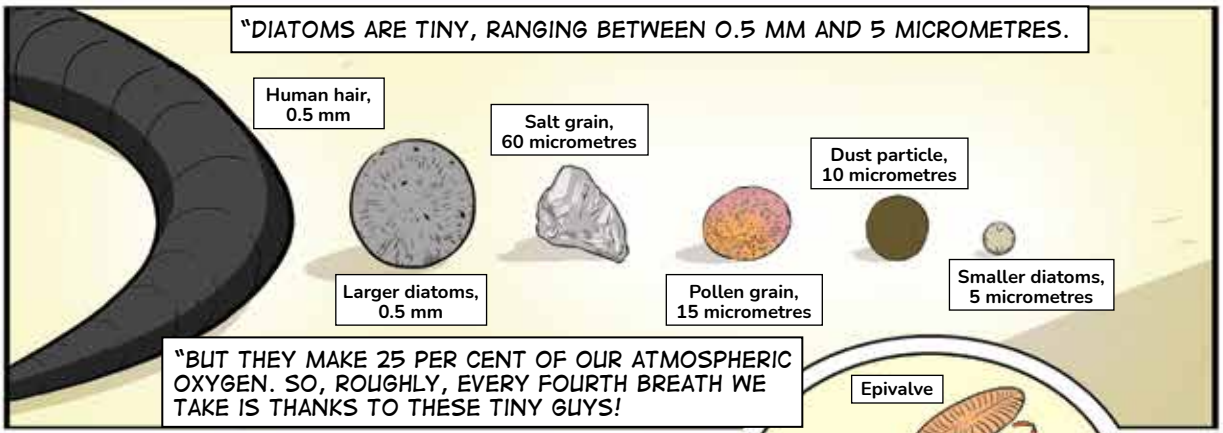


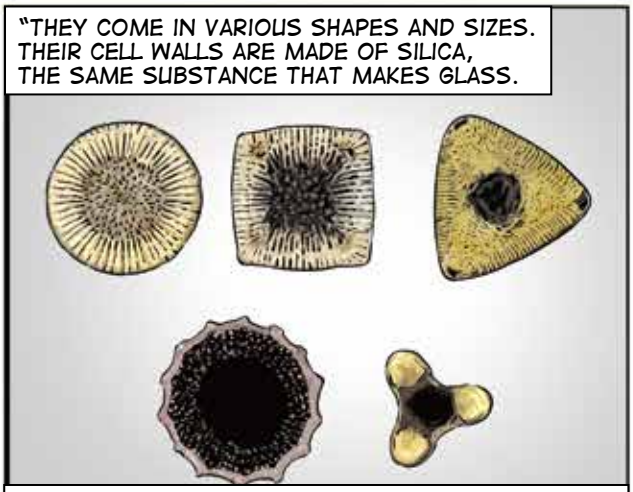

THIS IS DR. KARTHICK BALASUBRAMANIAN, A SCIENTIST AT AGHARKAR RESEARCH INSTITUTE, PUNE, WHO STUDIES BIOLOGY AND BIODIVERSITY.
I COULDN'T HELP BUT OVERHEAR THIS YOUNG LADY SAY SHE WAS COVERED IN "SCUM AND SLIME" FROM THE RIVER.

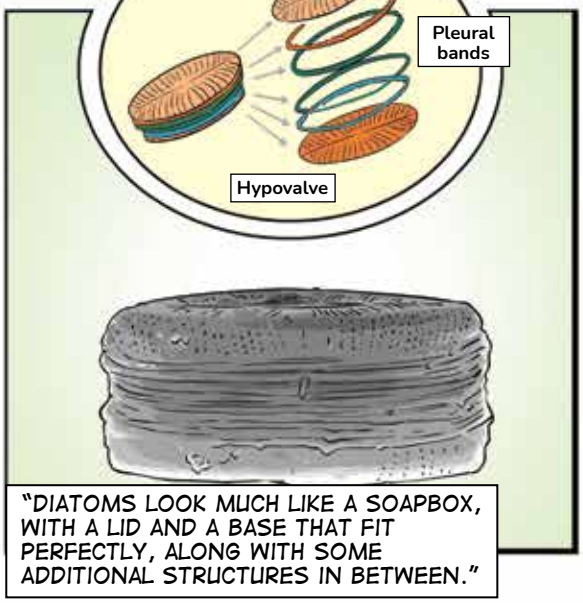

ACTUALLY, YOU'RE MORE LIKELY COVERED IN DIATOMS.
EEEK! GET THEM OFF ME! GET THEM OFF ME!


WAIT, DI-WHAT?


DIATOMS. THEY'RE MICROSCOPIC ALGAE. ALGAE ARE ORGANISMS THAT MAKE THEIR OWN FOOD WITH SUNLIGHT, LIKE PLANTS DO.


"DIATOMS ARE TINY, RANGING BETWEEN 0.5 MM AND 5 MICROMETRES.
Human hair, 0.5 mm
Salt grain, 60 micrometres
Dust particle, 10 micrometres
Larger diatoms, 0.5 mm
Pollen grain, 15 micrometres
Smaller diatoms, 5 micrometres
"BUT THEY MAKE 25 PER CENT OF OUR ATMOSPHERIC OXYGEN. SO, ROUGHLY, EVERY FOURTH BREATH WE TAKE IS THANKS TO THESE TINY GUYS!


"THEY COME IN VARIOUS SHAPES AND SIZES. THEIR CELL WALLS ARE MADE OF SILICA, THE SAME SUBSTANCE THAT MAKES GLASS.
"THEY LIVE IN WET PLACES SUCH AS RIVERS, SEAS AND OCEANS. ANYWHERE THEY CAN PHOTOSYNTHESIZE—MAKE FOOD FROM SUNLIGHT.


Epivalve
Pleural bands
Hypovalve
"DIATOMS LOOK MUCH LIKE A SOAPBOX, WITH A LID AND A BASE THAT FIT PERFECTLY, ALONG WITH SOME ADDITIONAL STRUCTURES IN BETWEEN."

WE'VE BEEN STUDYING MICROBES—CREATURES SO SMALL THAT WE NEED MICROSCOPES TO SEE THEM.

YES, AND WE'VE COVERED BACTERIA, SOME FUNGI AND EVEN ALGAE. BUT NOT DIATOMS.

DIATOMS HAVE BEEN STUDIED IN INDIA SINCE THE 19TH CENTURY. WE KNOW AROUND 7,000 TYPES IN OUR SUBCONTINENT! THERE MUST BE MORE BECAUSE MANY INDIAN REGIONS HAVEN'T YET BEEN STUDIED.

IF THEY ARE UNDERSTUDIED, HOW DO SCIENTISTS KNOW SO MUCH ABOUT THEM?

THANKS TO DR. H.P. GANDHI, WHO STUDIED THEM IN INDIA. HE FOUND NEARLY 300 NEW SPECIES! THIS BOOK, HIS WORK, IS MOST WIDELY REFERRED TO FOR INDIAN DIATOMS.

BUT I'M STILL COVERED IN THEM! WILL THEY INFECT ME? OR WORSE, EAT ME UP?

HAHAHA! NO, NO. DIATOMS AREN'T HARMFUL TO US. RATHER, THEY'RE QUITE USEFUL.

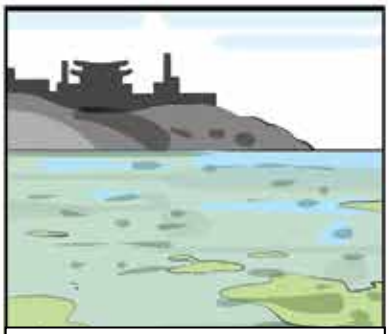
"THEY CAN BE GOOD FOR OUR HEALTH. THEY'RE USED IN MAKING VARIOUS MEDICINES, NUTRITIONAL PILLS, AND EVEN COSMETICS.

"THEIR MANY SHAPES AND SIZES INSPIRE NANOTECHNOLOGY—TECHNOLOGY AT A VERY TINY SCALE.

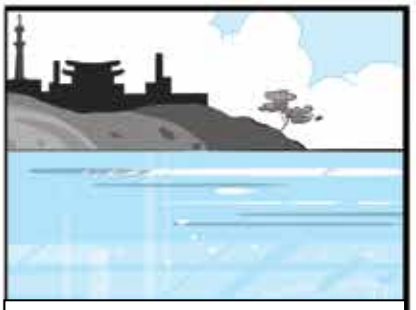
"THE PRINCIPLES THAT DIATOMS USE TO MAKE THEIR CELLS ARE USED FOR BIOLOGICAL AND EVEN CONSTRUCTION PURPOSES.

"SINCE THEY HAVE SILICA CELL WALLS, THEY DO NOT DECOMPOSE AFTER DEATH. THEY BECOME FOSSILS.

"THEY ARE DEPOSITED IN LAYERS OVER THOUSANDS OF YEARS. BY STUDYING THEM, WE CAN TELL THE WATER QUALITY OF RIVERS OVER TIME.

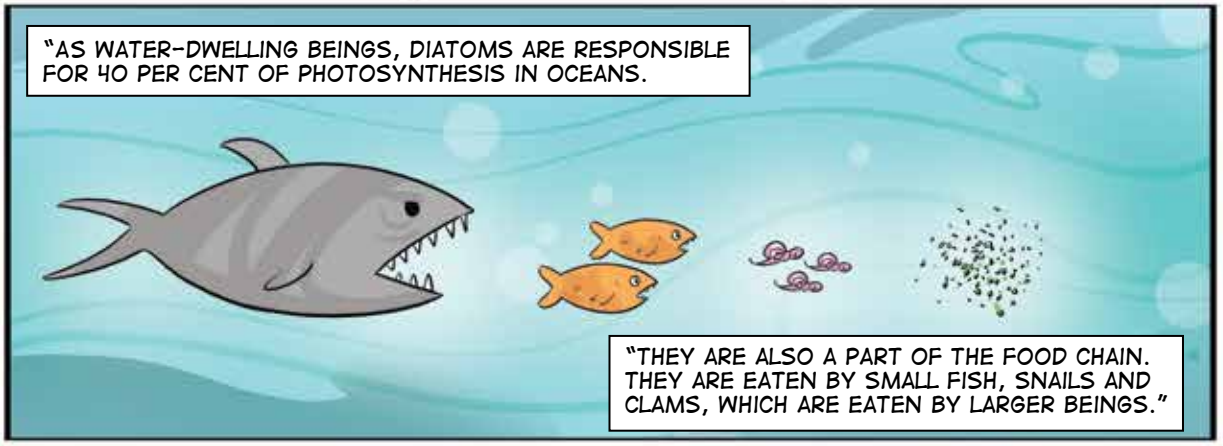


"SPEAKING OF WHICH, THERE ARE DIFFERENT TYPES OF DIATOMS THAT THRIVE IN CLEAN WATER AND OTHERS THAT ARE FOUND IN POLLUTED WATER.



"BY ANALYSING THE DIATOMS IN THEM, SCIENTISTS HAVE FOUND THAT RIVERS IN JAPAN HAVE IMPROVED THEIR WATER QUALITY BETWEEN THE 1960S AND 2010.

"AS WATER-DWELLING BEINGS, DIATOMS ARE RESPONSIBLE FOR 40 PER CENT OF PHOTOSYNTHESIS IN OCEANS.



"THEY ARE ALSO A PART OF THE FOOD CHAIN. THEY ARE EATEN BY SMALL FISH, SNAILS AND CLAMS, WHICH ARE EATEN BY LARGER BEINGS."