

CORAL HEROES

ADVENTURES ON THE REEFS OF TOWABONGA



secore
international

OUR HEROES ...

SAMY SMART

LEATHERY CORAL



JO GRUMPY

BRAIN CORAL



CORAL REEFS - BURSTING WITH LIFE

TROPICAL CORAL REEFS MAKE UP LESS THAN ONE PERCENT OF THE SEABED WORLDWIDE, ASTONISHINGLY ENOUGH, THEY ARE HOME TO THOUSANDS OF ANIMAL AND PLANT SPECIES. WHILE VAST PARTS OF THE SEAFLOOR ARE PLAIN, SOFT BOTTOMS HOSTING RELATIVELY FEW SPECIES, CORAL REEFS BURST WITH LIFE! THERE ARE 1500 REEF-FORMING CORAL SPECIES WORLDWIDE, MOST OF THEM CAN BE FOUND IN THE SUN-FILLED SHALLOW WATERS OF THE TROPICS. EVEN IN THE COLD AND DARK DEEP-SEA YOU WILL FIND CORAL REEFS; BIODIVERSITY HOTSPOTS AMIDST MUDDY AND SPECIES-POOR ABYSSAL GROUNDS.



ELKHORN CORAL



AL MOOSE

BRAN RAMOSY



BRANCHING CORAL



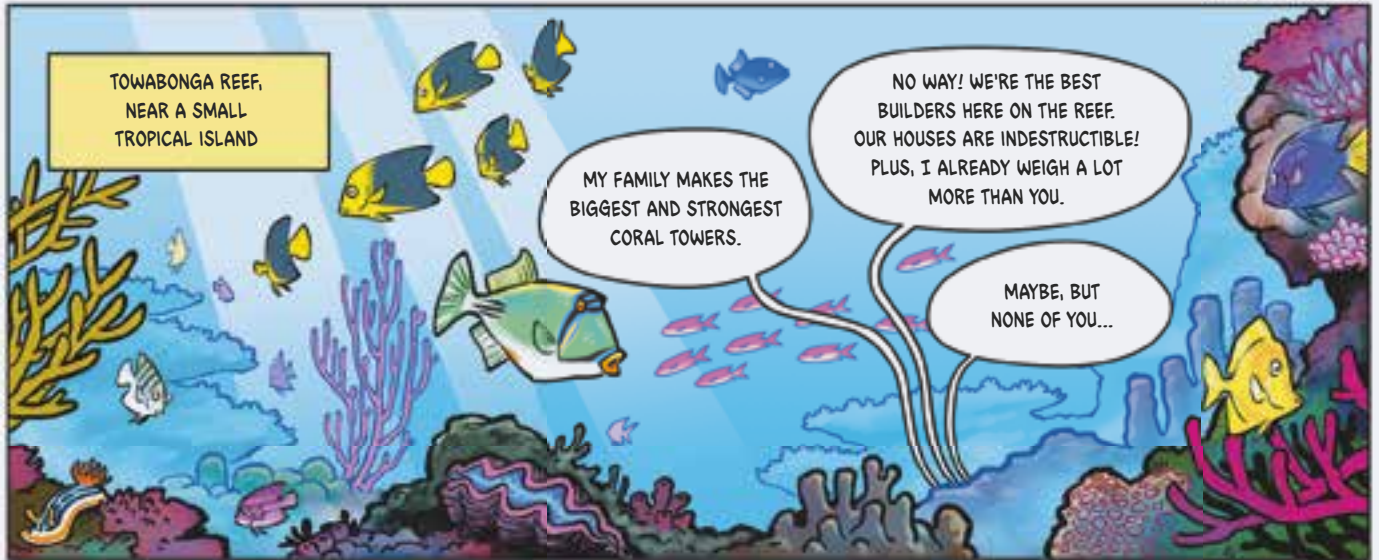
OCTOPUS

DOC KRAKEN



WHO IS THE BEST BUILDER?

STORY: SINA LÜSCHKE, CARIN JANTZEN ILLUSTRATION: BERNHARD SPER WWW.SECORE.ORG



TOWABONGA REEF,
NEAR A SMALL
TROPICAL ISLAND

MY FAMILY MAKES THE
BIGGEST AND STRONGEST
CORAL TOWERS.

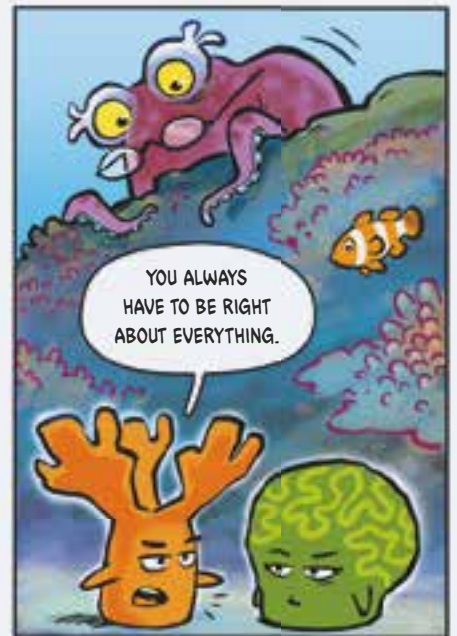
NO WAY! WE'RE THE BEST
BUILDERS HERE ON THE REEF.
OUR HOUSES ARE INDESTRUCTIBLE!
PLUS, I ALREADY WEIGH A LOT
MORE THAN YOU.

MAYBE, BUT
NONE OF YOU...

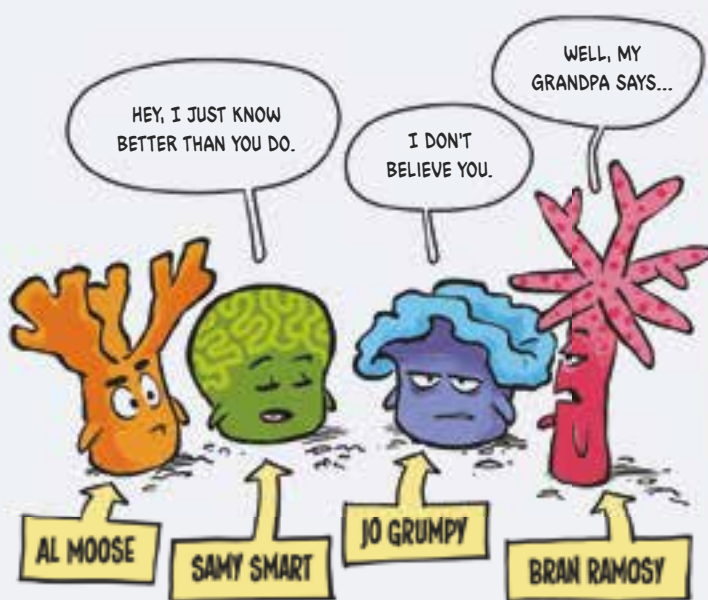


...CAN BUILD AS FAST AS
WE CAN. WE BRANCHING CORALS
ARE THE BEST, AND THAT'S A FACT!

HMM,
WHAT'S GOING ON
OVER THERE?



YOU ALWAYS
HAVE TO BE RIGHT
ABOUT EVERYTHING.



HEY, I JUST KNOW
BETTER THAN YOU DO.

I DON'T
BELIEVE YOU.

WELL, MY
GRANDPA SAYS...

AL MOOSE

SAMY SMART

JO GRUMPY

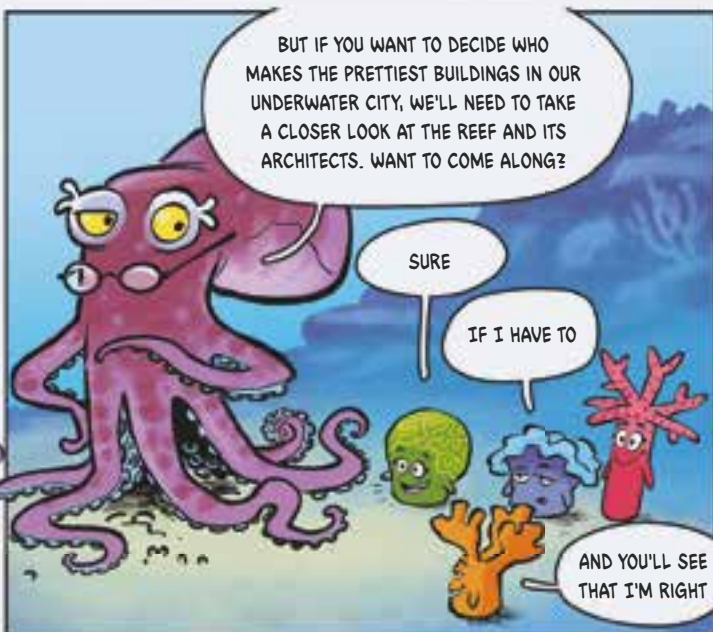
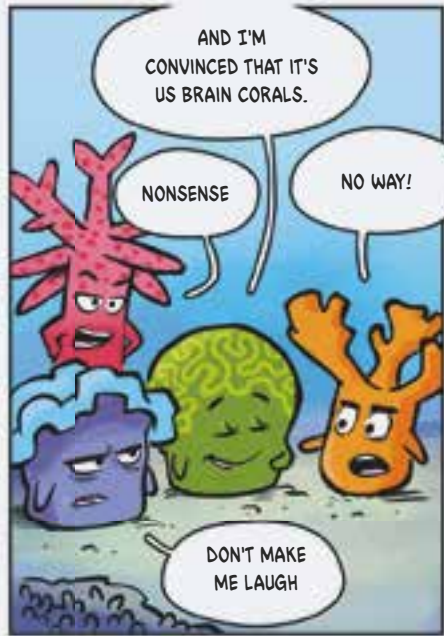
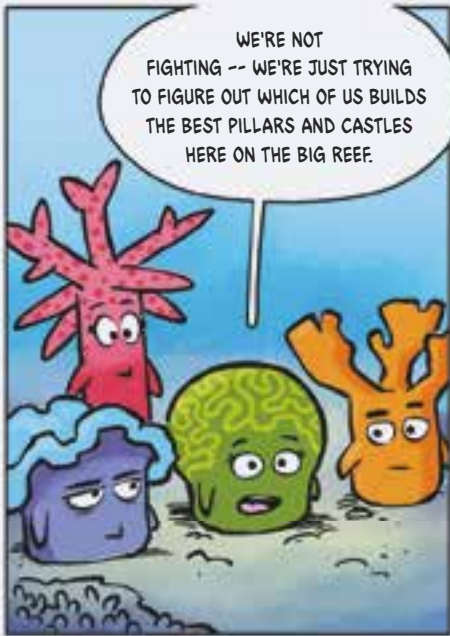
BRAN RAMOSY



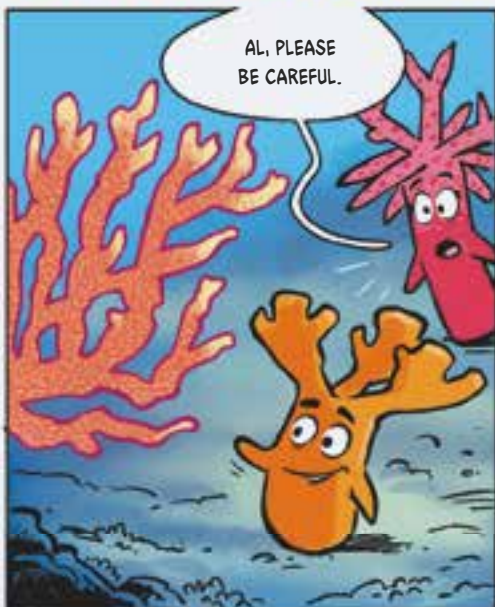
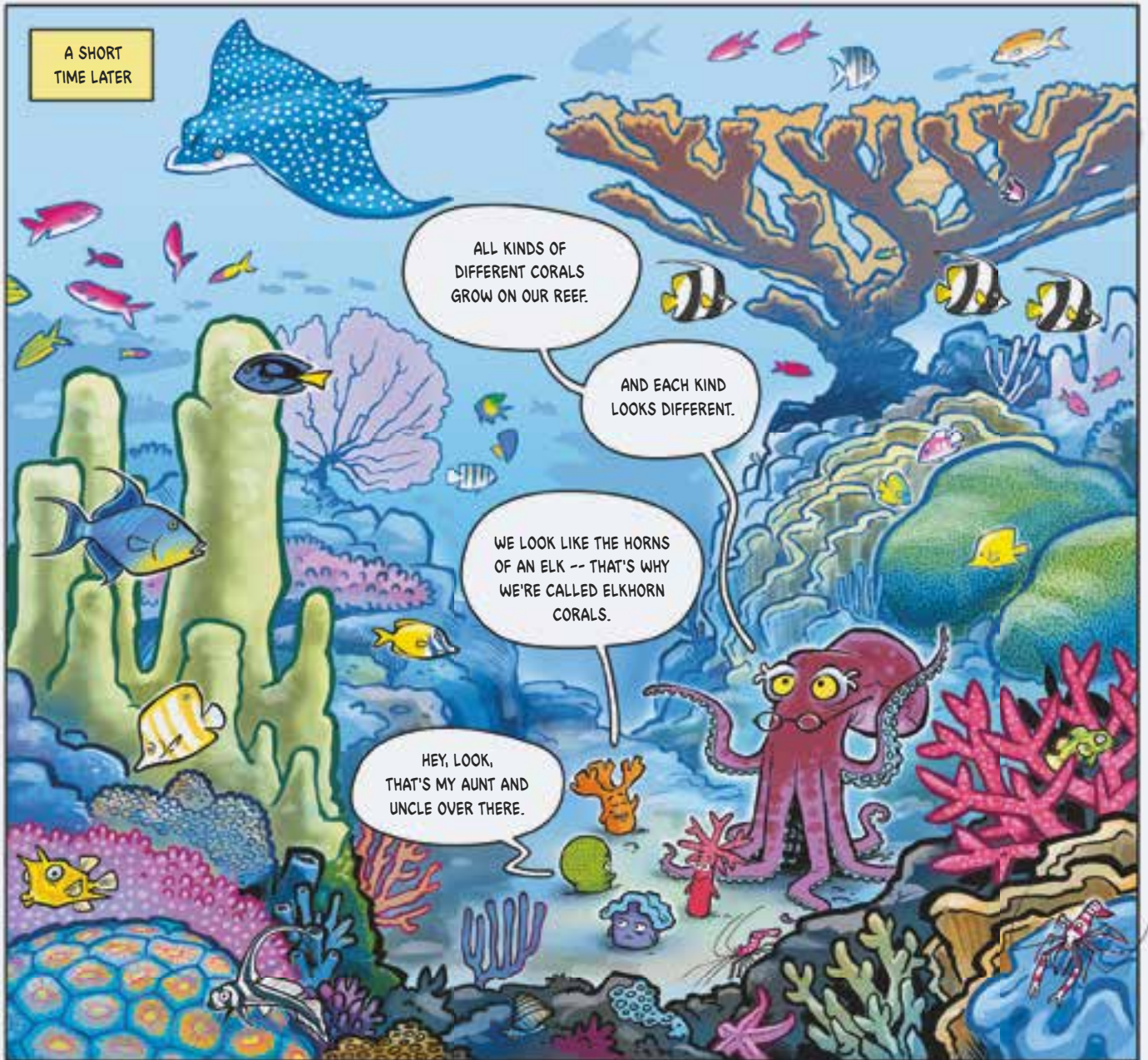
HEY YOU GUYS,
WHAT'S ALL THE COMMOTION?
MY INK SAC PRACTICALLY
BURST!

GULP.

HI, DOC KRAKEN.



A SHORT
TIME LATER





HEY, DOC KRAKEN,
THERE'S SOMETHING WRONG
WITH THIS CORAL. THERE ARE SLIMY
LITTLE HAIRS ALL OVER IT!

WOW, AND THEY'RE
MOVING ALL OVER
THE PLACE!

HMM, LET'S TAKE A
CLOSER LOOK AT THOSE
LITTLE HAIRS...

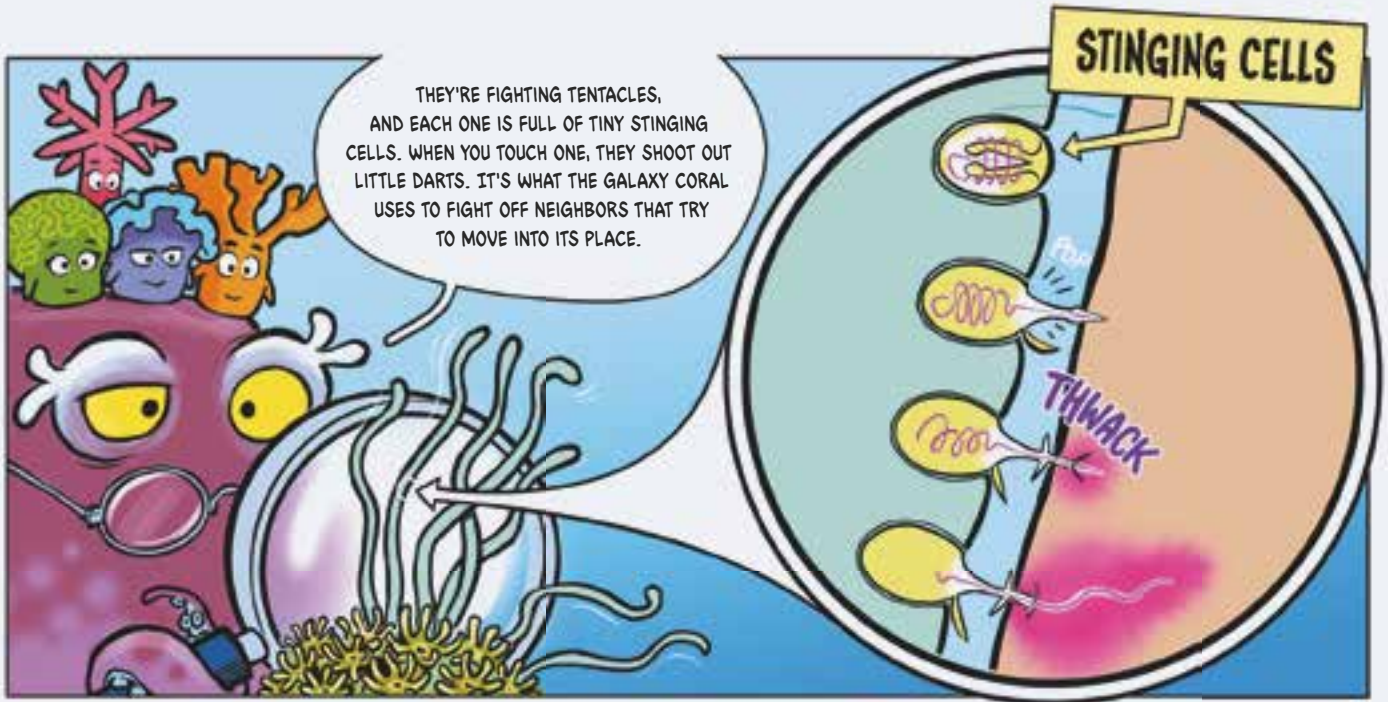
...WITH MY SUPER-ZOOM
MAGNIFYING GLASS.

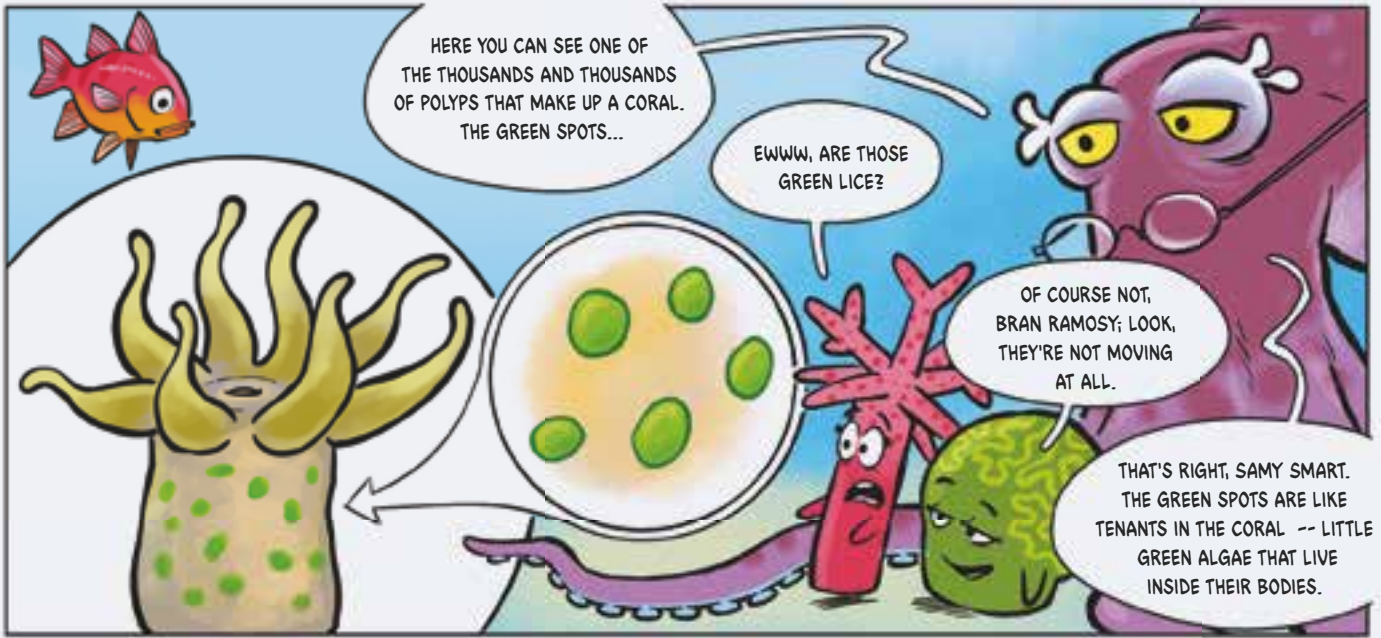
YEAH!
COOL

THEY'RE NOT
HAIRS; THEY'RE LITTLE
TENTACLES.

CAN I
TOUCH ONE?

CAREFUL, AL;
THESE TENTACLES
ARE NO LAUGHING
MATTER.





HERE YOU CAN SEE ONE OF THE THOUSANDS AND THOUSANDS OF POLYPS THAT MAKE UP A CORAL. THE GREEN SPOTS...

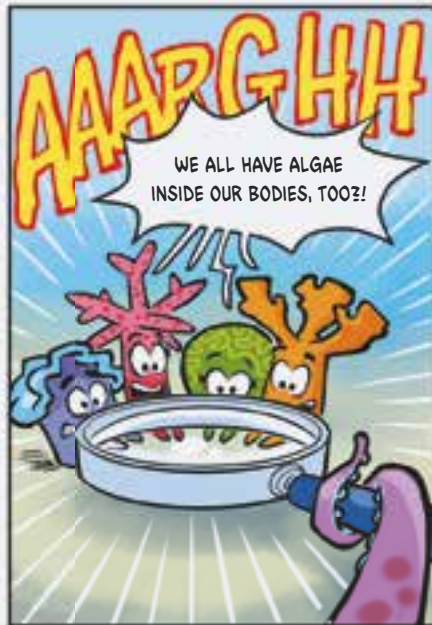
EWWW, ARE THOSE GREEN LICE?

OF COURSE NOT, BRAN RAMOSY; LOOK, THEY'RE NOT MOVING AT ALL.

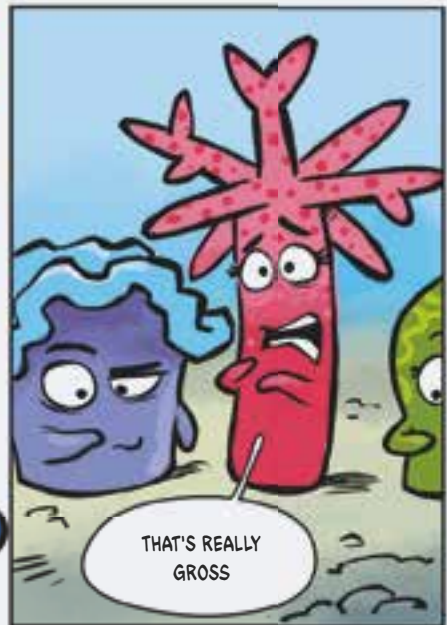
THAT'S RIGHT, SAMY SMART. THE GREEN SPOTS ARE LIKE TENANTS IN THE CORAL -- LITTLE GREEN ALGAE THAT LIVE INSIDE THEIR BODIES.



HERE, HOLD YOUR HANDS UNDER THE MAGNIFYING GLASS.



AAARGHH
WE ALL HAVE ALGAE INSIDE OUR BODIES, TOO?!

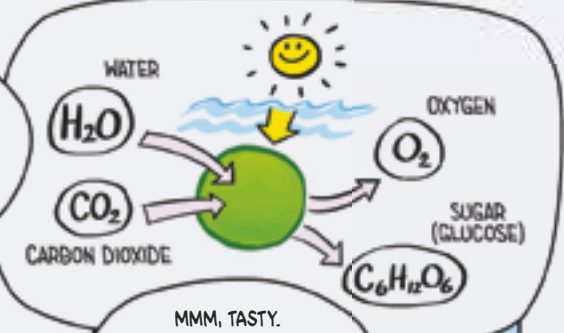


THAT'S REALLY GROSS



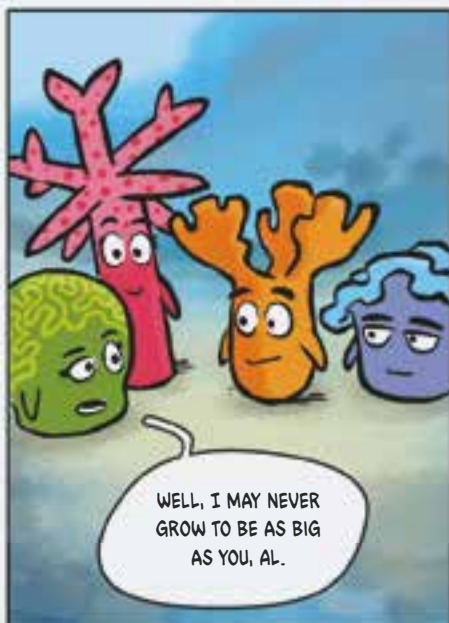
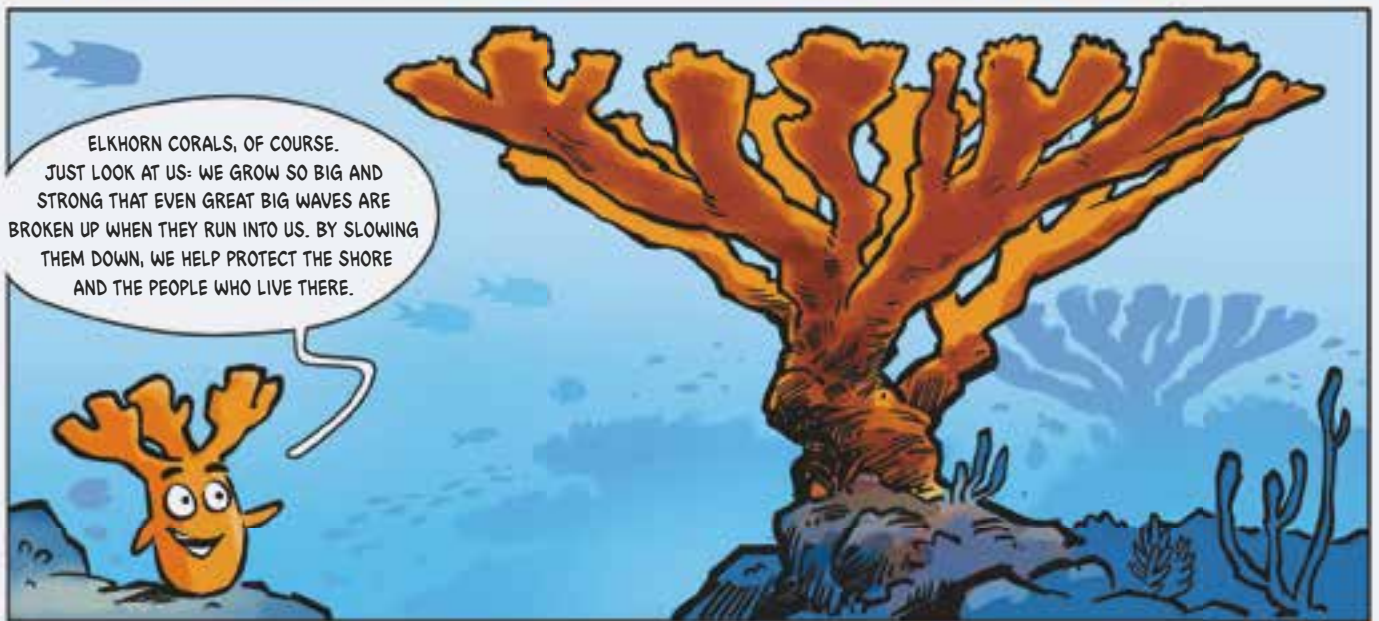
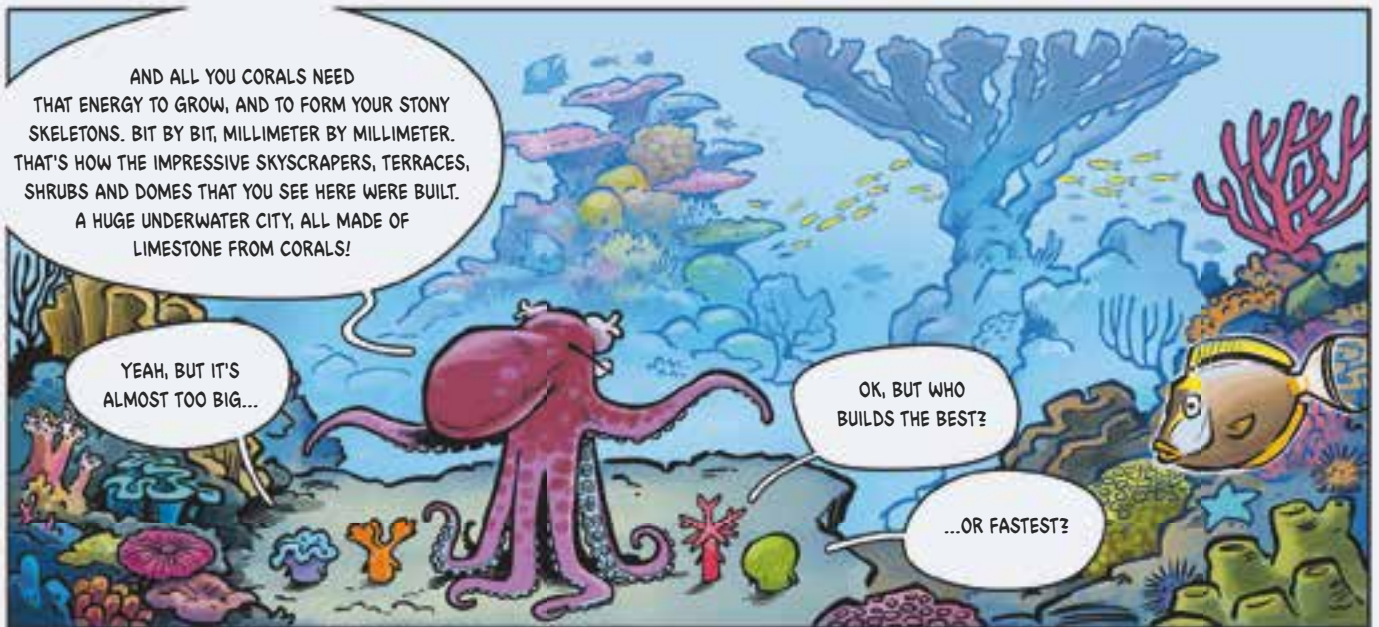
NO IT ISN'T; ON THE CONTRARY.

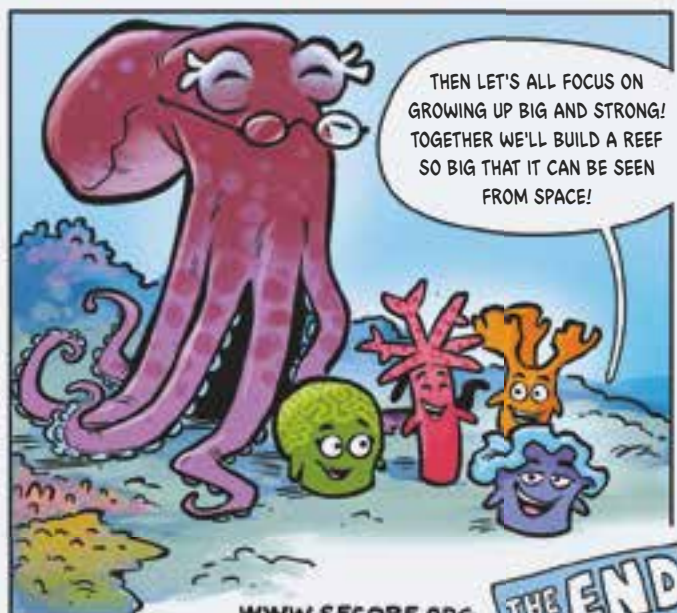
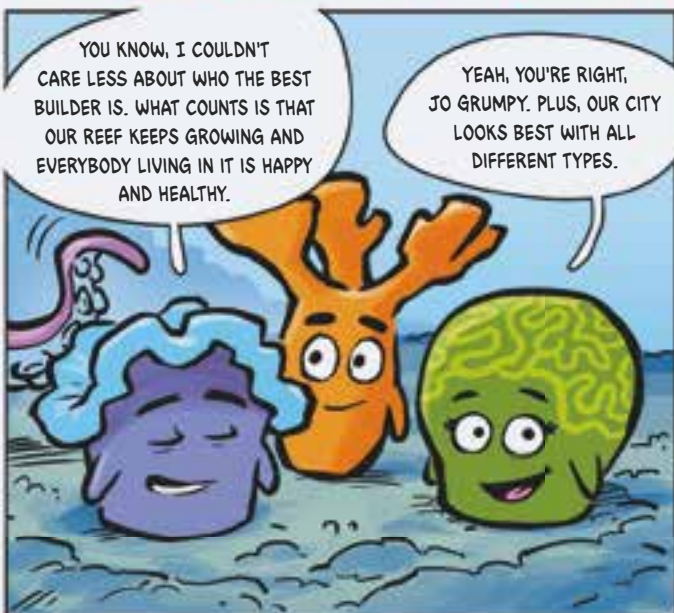
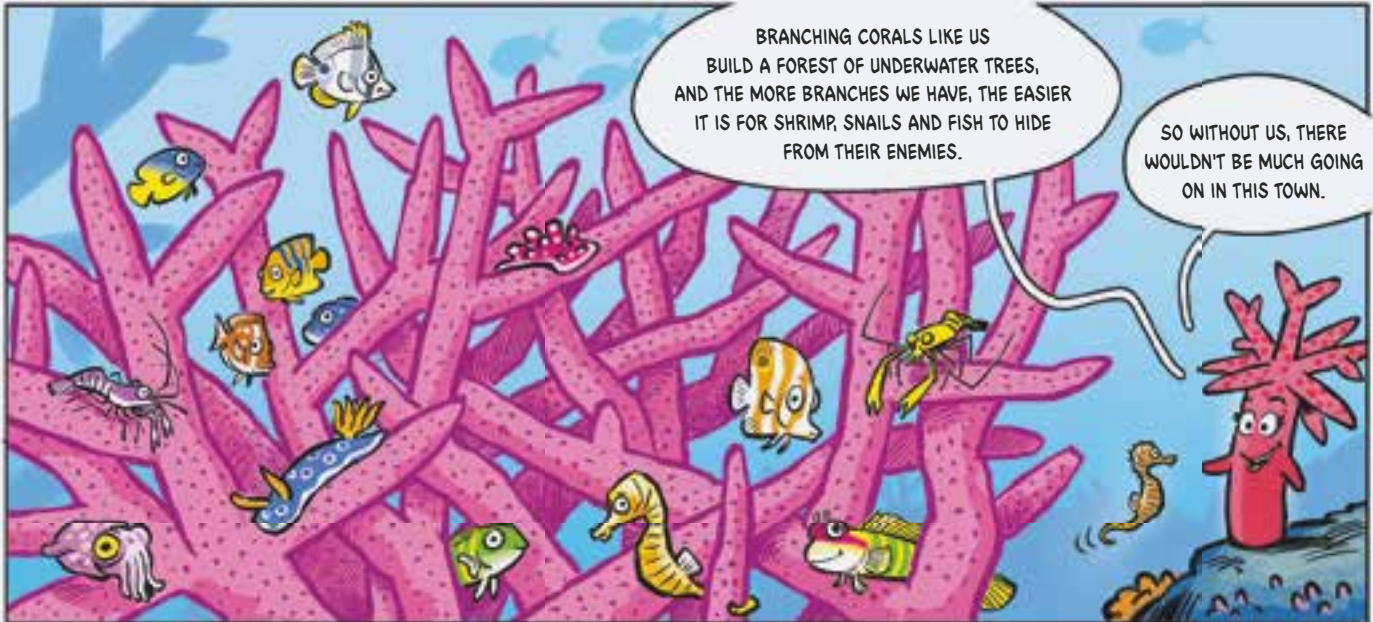
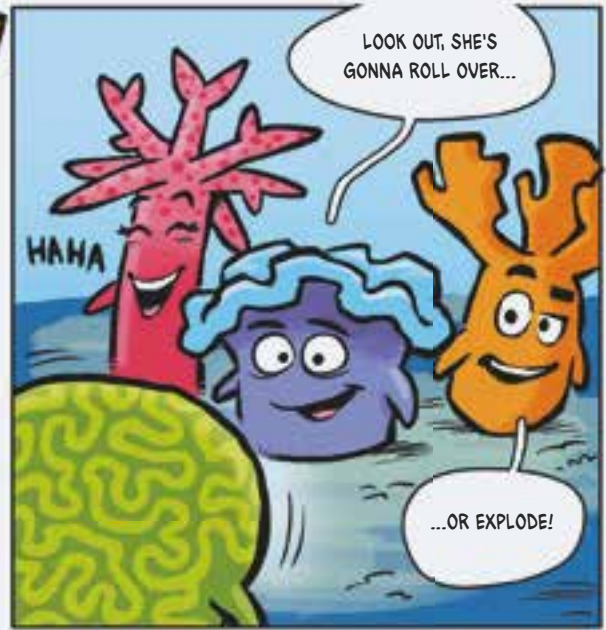
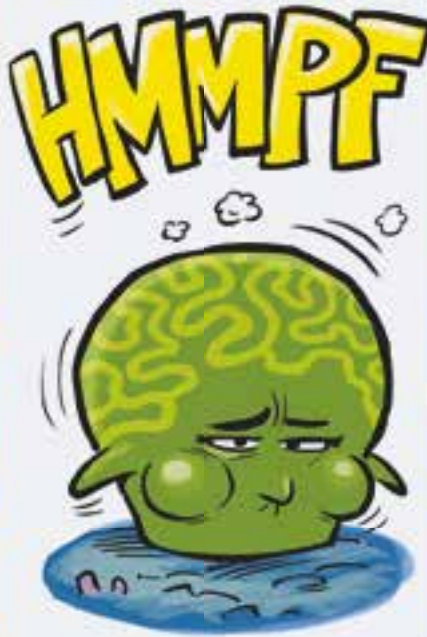
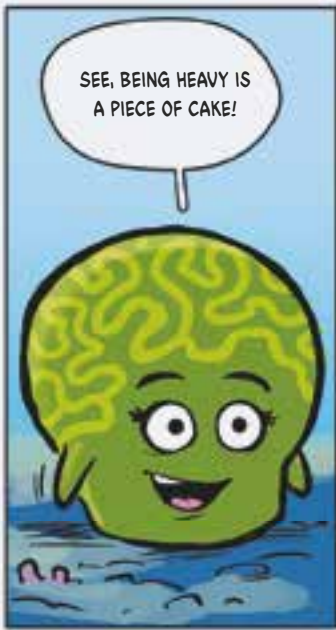
YOU CORALS ARE LUCKY TO HAVE THESE ALGAE. WITH A BIT OF SUNLIGHT THEY PRODUCE PLENTY OF SUGAR, SOME OF WHICH THEY SECRETLY PASS ON TO YOU -- AS A THANK-YOU FOR KEEPING THEM SAFE.



MMM, TASTY. I LOVE SUGAR. IT'S FULL OF ENERGY!







HARD FACTS

DOC KRAKEN'S COUSINS

OCTOPUSES ARE AMAZINGLY SMART ANIMALS WHO BELONG TO THE MOLLUSCAN CLASS CEPHALOPODS. THEY ARE ABLE TO CHANGE THEIR SKIN COLOR AND TEXTURE TO CAMOUFLAGE WITHIN THEIR SURROUNDINGS. THE COMMON OCTOPUS OWNS EIGHT TENTACLES, EACH UP TO A METER LONG AND LINED WITH TWO ROWS OF SUCTION CUPS. HE SKILLFULLY APPLIES THESE TENTACLES, AND CAN EVEN USE THEM TO WIELD TOOLS SUCH AS STICKS. WHILE USING HIS PARROT-LIKE BEAK, HE LIKES TO CRACK OPEN SCALLOPS AND OTHER SHELL BEARING ANIMALS.



BREAKING WAVES

ELKHORN CORALS GROW IN THE SUNLIGHT SHALLOW WATERS OF THE CARIBBEAN. THEY SHIELD THE COAST BY ABSORBING WAVE ENERGY WITH THEIR 'ANTLERS'. SOME DECADES AGO, THEY FORMED A PROTECTION BELT ALONG THE COASTLINE. TODAY, THERE ARE OFTEN ONLY SINGLE ELKHORN COLONIES LEFT AND THE SPECIES CAN BE FOUND ON THE RED LIST OF ENDANGERED SPECIES. DO YOU THINK THEIR 'ANTLERS' LOOK LIKE THE ONES OF A MOOSE?

STONY CORALS BUILD UP THE REEFS

THERE ARE STONY AND SOFT CORALS, AS WELL AS SEA FANS AND WHIPS. SOFT CORALS, LIKE TREE CORALS, ARE OFTEN COLORFUL AND HAVE TINY LIMESTONE NODULES WITHIN THEIR BODY. THEIR BODY IS BASICALLY A BULGING TUBE, STABILIZED BY WATER PRESSURE. SEA FANS AND WHIPS HAVE A FLEXIBLE, HORNY SKELETON, WHICH ALLOWS THEM TO SWAY WITH THE CURRENT OR SWELL. OFTEN A FEATHER STAR SITS ON TOP OF A SEA FAN, TAKING ADVANTAGE OF ITS EXPOSED SPOT TO CATCH MICROORGANISMS OUT OF THE WATER FLOWING PAST FOR A TASTY MEAL. IT'S ONLY THE STONY CORALS WHO BUILD UP A ROCK-LIKE SKELETON MADE OF CALCIUM CARBONATE. THE DEAD PART BELOW THE LIVING CORAL FORMS THE REEF'S FRAMEWORK. THIS REEF SUBSTRUCTURE IS INTERVEINED BY CREVICES AND A KIND OF CAVE SYSTEM, POPULATED BY SPONGES AND OTHER ANIMALS.



SCHEDULED OFFSPRING

FOR WELL-STUDIED CORAL SPECIES, SCIENTISTS MAY BE ABLE TO PREDICT THE TIMING OF CORAL SPAWNING ALMOST TO THE MINUTE. TO SYNCHRONIZE THEIR SPAWNING, CORALS ARE GUIDED BY THE TEMPERATURE DURING A YEAR TO SET THE MONTH, THE LUNAR CYCLE TO SET THE DAY, AND THE TIME AFTER SUNSET TO SET THE EXACT HOUR. FOR INSTANCE, THE ELKHORN CORALS ON CURAÇAO USUALLY START THEIR RENDEZVOUS AT 9:15PM ON THE DOT AND THEN SPAWN FOR ABOUT HALF AN HOUR.

THE MIGHTIEST ARCHITECTS

CORAL REEFS ARE THE GREATEST STRUCTURES THAT HAVE BEEN BUILT BY LIVING BEINGS ON EARTH. YOU CAN EVEN SEE THEM FROM SPACE! FROM THE FOSSIL RECORD WE KNOW THAT CORAL REEFS HAVE EXISTED FOR OVER 400 MILLION YEARS. THE ANCIENT CORALS WHO POPULATED THE REEFS BACK THEN ARE CALLED RUGOSA AND TABULATA AND HAD A DIFFERENT BUT STILL CALCAREOUS SKELETON LIKE THE CORALS TODAY. STONY CORALS AS WE KNOW THEM APPEARED AROUND THE TIME OF THE FIRST DINOSAURS. MODERN CORAL REEFS HAVE EXISTED FOR THE PAST 60 MILLION YEARS. AT PRESENT, CORAL REEFS ARE THREATENED: THE MAIN REASONS ARE CLIMATE CHANGE, POLLUTION AND OVERFISHING.

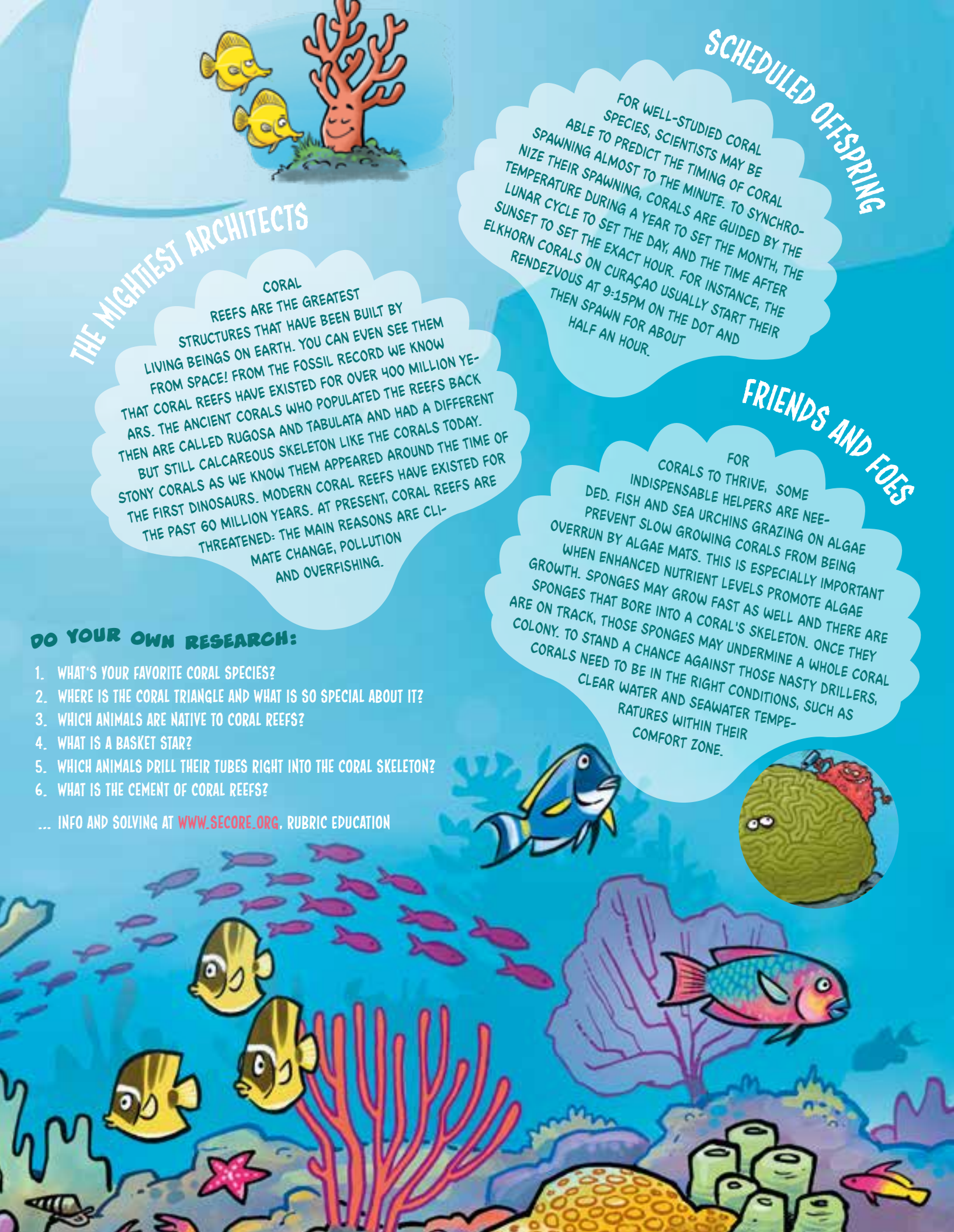
FRIENDS AND FOES

FOR CORALS TO THRIVE, SOME INDISPENSABLE HELPERS ARE NEEDED. FISH AND SEA URCHINS GRAZING ON ALGAE PREVENT SLOW GROWING CORALS FROM BEING OVERRUN BY ALGAE MATS. THIS IS ESPECIALLY IMPORTANT WHEN ENHANCED NUTRIENT LEVELS PROMOTE ALGAE GROWTH. SPONGES MAY GROW FAST AS WELL AND THERE ARE SPONGES THAT BORE INTO A CORAL'S SKELETON. ONCE THEY ARE ON TRACK, THOSE SPONGES MAY UNDERMINE A WHOLE CORAL COLONY. TO STAND A CHANCE AGAINST THOSE NASTY DRILLERS, CORALS NEED TO BE IN THE RIGHT CONDITIONS, SUCH AS CLEAR WATER AND SEAWATER TEMPERATURES WITHIN THEIR COMFORT ZONE.

DO YOUR OWN RESEARCH:

1. WHAT'S YOUR FAVORITE CORAL SPECIES?
2. WHERE IS THE CORAL TRIANGLE AND WHAT IS SO SPECIAL ABOUT IT?
3. WHICH ANIMALS ARE NATIVE TO CORAL REEFS?
4. WHAT IS A BASKET STAR?
5. WHICH ANIMALS DRILL THEIR TUBES RIGHT INTO THE CORAL SKELETON?
6. WHAT IS THE CEMENT OF CORAL REEFS?

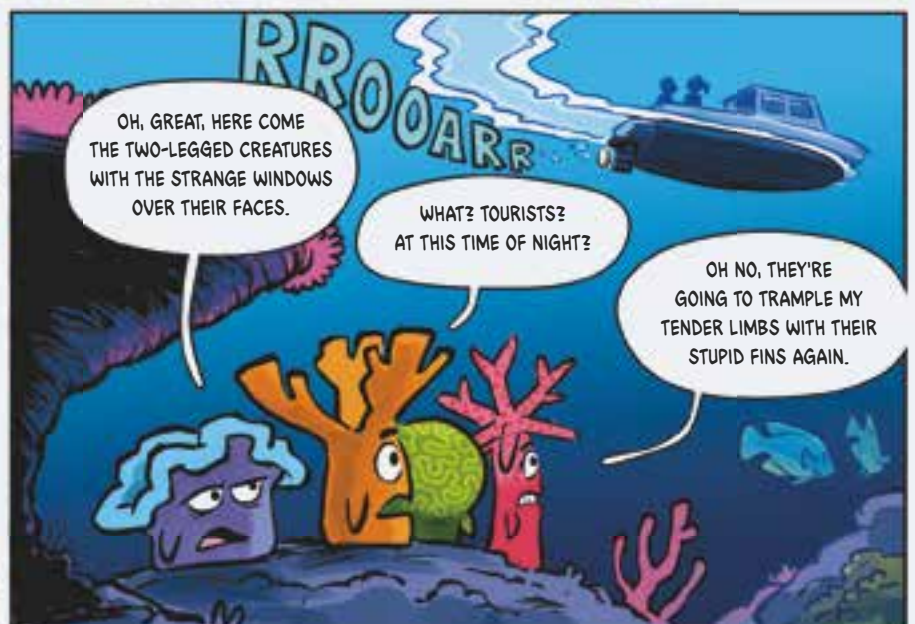
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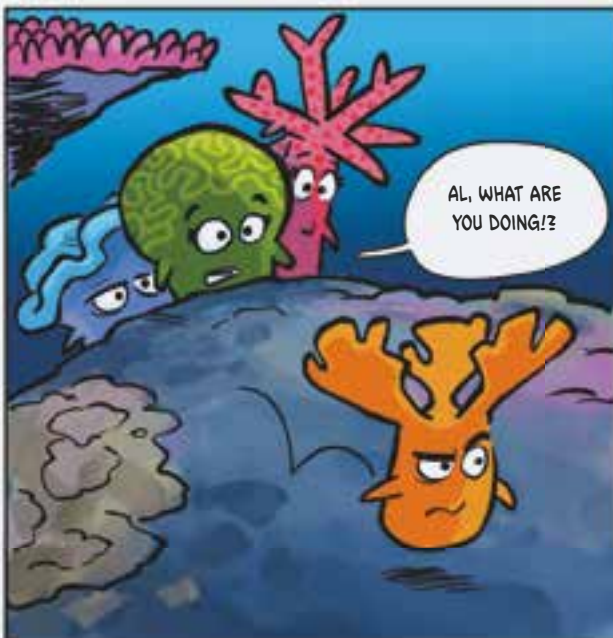


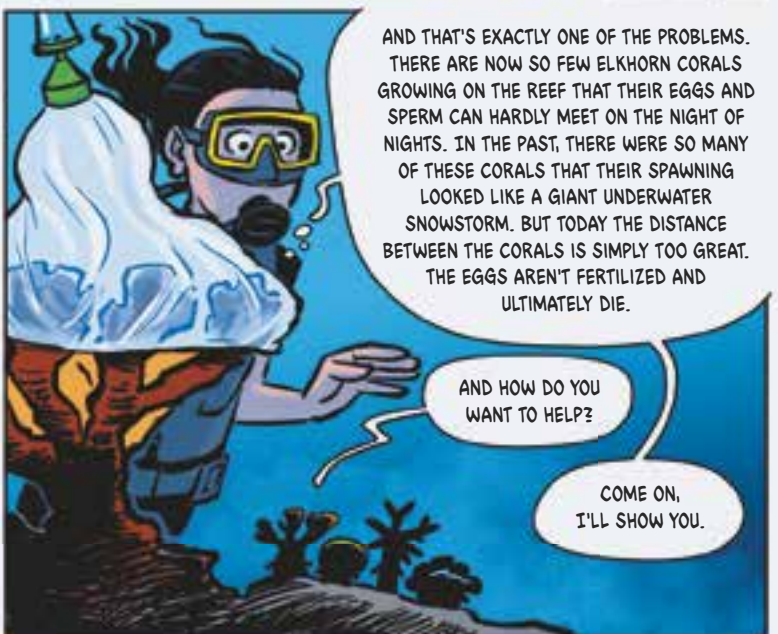
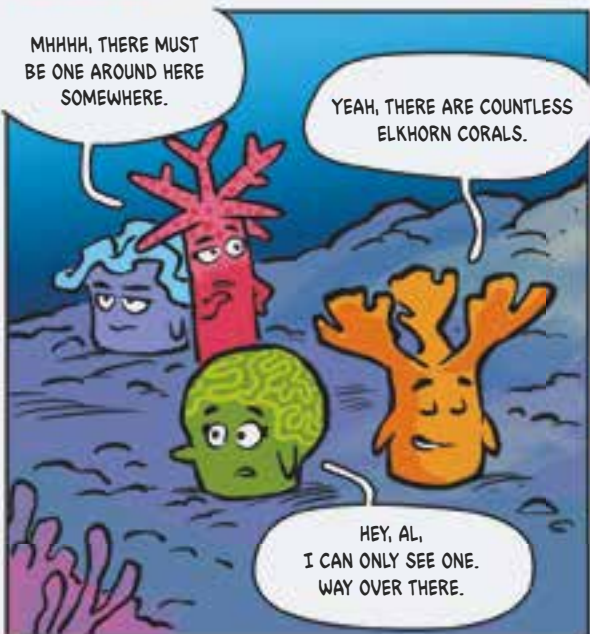
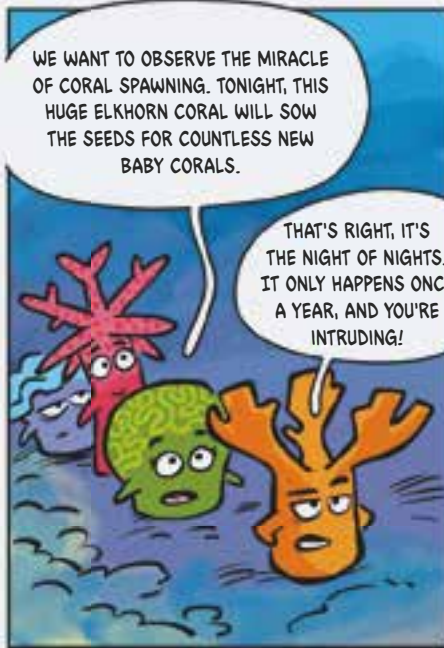
UNDER AUGUST'S FULL MOON

STORY- SINA LÖSCHKE, CARIN JANTZEN - ILLUSTRATION- BERNHARD SPEH - WWW.SECORE.ORG

TOWABONGA REEF, NEAR A SMALL TROPICAL ISLAND. IT'S 9 P.M. ON THE NIGHT OF THE FULL MOON IN AUGUST.









BEFORE THE SPAWNING STARTS, WE CAREFULLY SPREAD NETS LIKE THIS ONE OVER THE CORALS.

ONCE THEY START RELEASING THEIR EGG AND SPERM PACKETS LIKE LITTLE BALLOONS, WE CAN CATCH THEM.



TAKE A CLOSER LOOK AT THIS BRANCH. I THINK IT'S ALMOST TIME.



WHAT? REALLY? OH, HOW EXCITING!

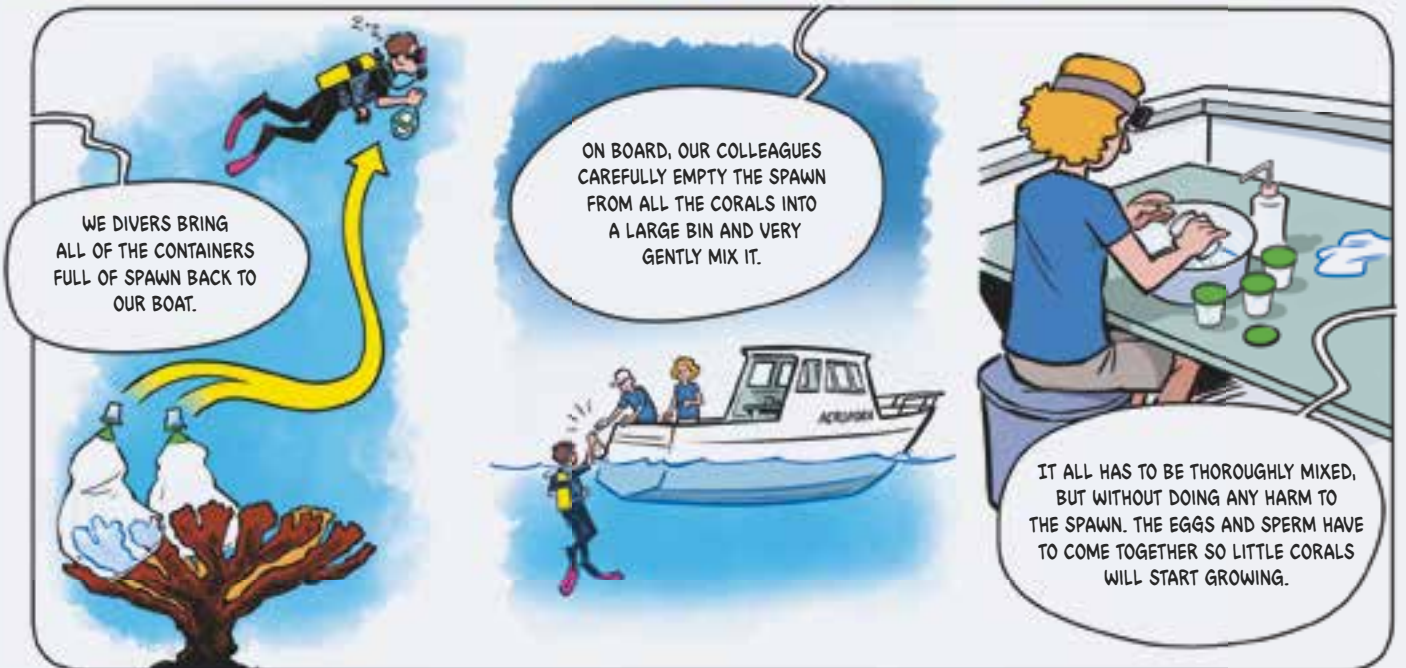
LOOK, THERE ARE LITTLE WHITE BALLS COMING OUT OF ALL THE LITTLE OPENINGS.

PLOP PLOP PLOP



SEVERAL MILLION, BECAUSE ALL OF THE CORALS IN A SPECIES SPAWN AT THE SAME TIME.

HOW MANY ARE THERE? A THOUSAND, HUNDRED THOUSAND, OR MILLION?





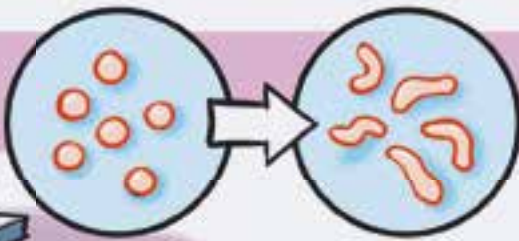
YOU MEAN YOU STEAL THE CORAL SPAWN? AND YOU CALL THAT HELPING?



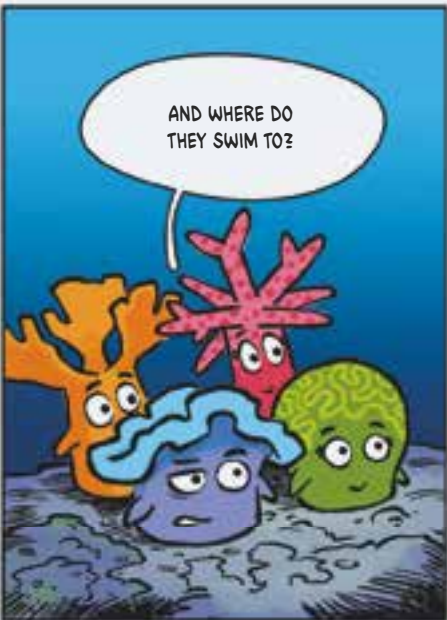
WAIT A MINUTE; THE STORY IS FAR FROM OVER.

WE TAKE THE BOX FULL OF SPAWN TO OUR FLOATING CORAL POOLS, WHICH ARE ANCHORED IN THE BAY.

NEXT, WE CAREFULLY PUT ALL OF THE FERTILIZED CORAL EGGS IN THESE POOLS, AND THEN OBSERVE HOW THEY GROW INTO TINY CORAL LARVAE.



AT FIRST, THEY DON'T LOOK LIKE REAL CORALS. BUT THEY CAN SWIM.

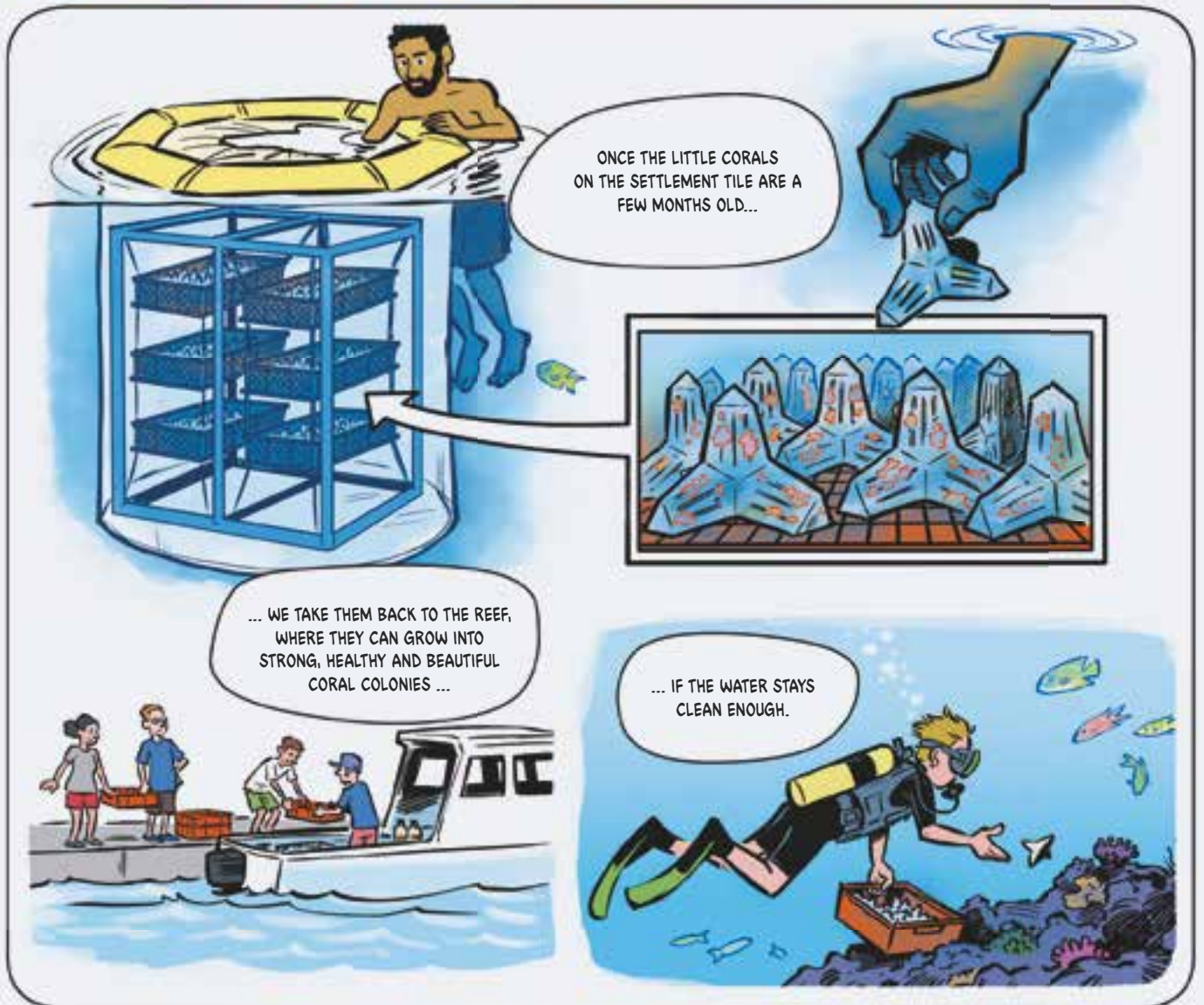
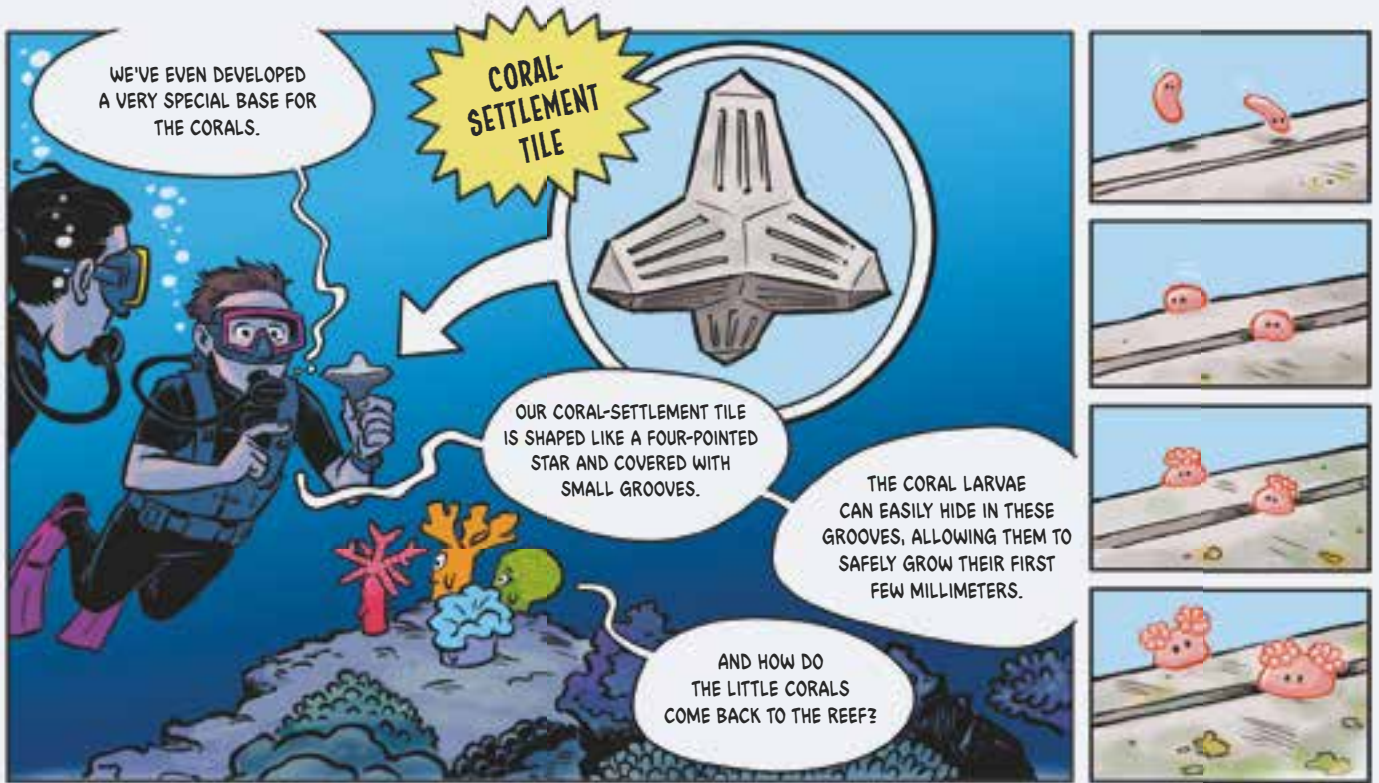


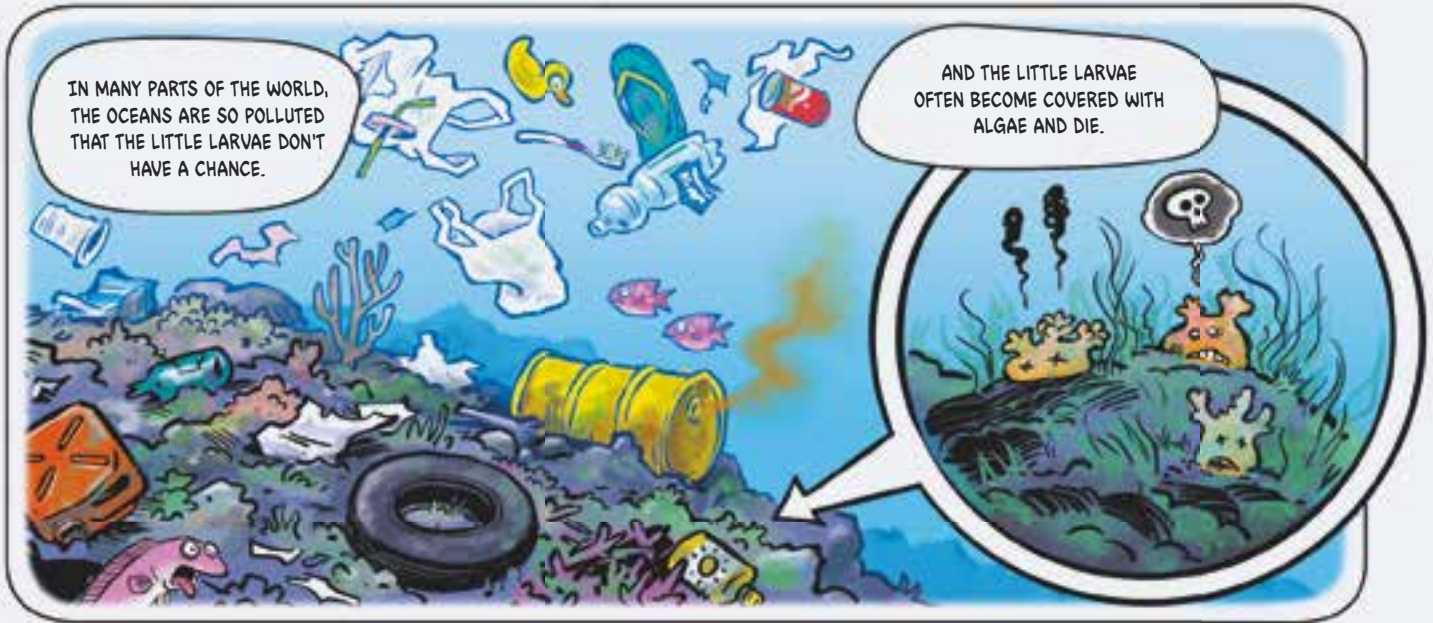
AND WHERE DO THEY SWIM TO?



THEY LOOK FOR A HARD BASE, LIKE THIS ROCK, WHERE THEY CAN SECURELY SETTLE.

HOW MANY OF THESE CORAL BASES DO YOU HAVE IN YOUR POOLS? I BET THERE ARE PLENTY MORE HERE ON THE REEF!



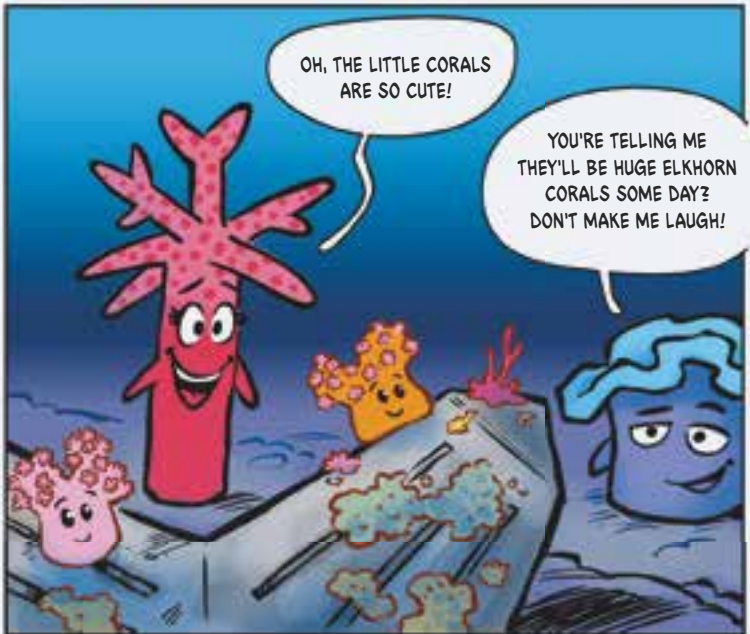


IN MANY PARTS OF THE WORLD, THE OCEANS ARE SO POLLUTED THAT THE LITTLE LARVAE DON'T HAVE A CHANCE.

AND THE LITTLE LARVAE OFTEN BECOME COVERED WITH ALGAE AND DIE.



BUT HERE ON TOWABONGA REEF, THE CONDITIONS ARE GOOD, AND THE CORAL BABIES ARE THRIVING. TAKE A CLOSER LOOK. CAN YOU SEE OUR TILES WITH BABY CORALS FROM LAST YEAR?



OH, THE LITTLE CORALS ARE SO CUTE!

YOU'RE TELLING ME THEY'LL BE HUGE ELKHORN CORALS SOME DAY? DON'T MAKE ME LAUGH!



IT TAKES AT LEAST FOUR YEARS FOR THE PLANTED CORALS TO REACH THE SIZE OF A FOOTBALL AND TO BE OLD ENOUGH TO HAVE BABIES OF THEIR OWN. BUT IF, A FEW YEARS FROM NOW, WE ONCE AGAIN HAVE PLENTY OF SPAWNING CORALS HERE ON THE REEF THEN THE CHANCES ARE GOOD THAT WE'LL SEE A LOT MORE CORAL BABIES AROUND HERE.

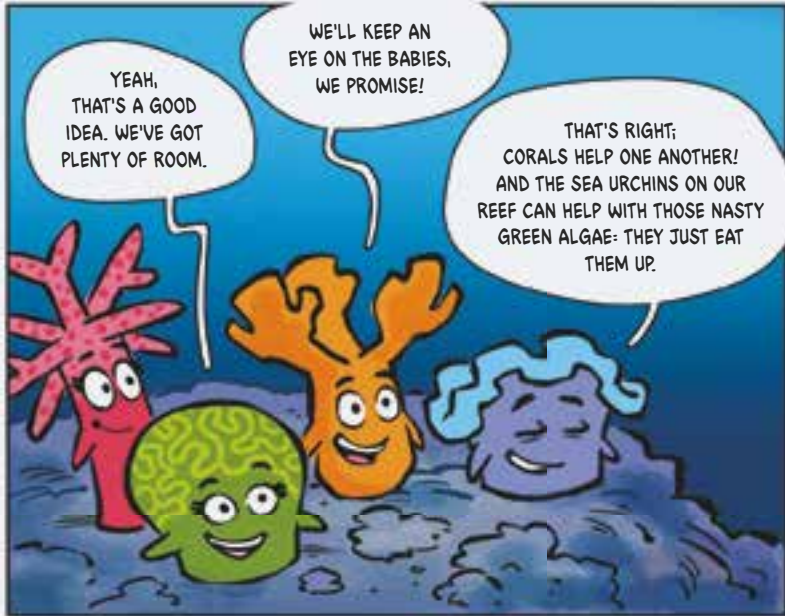
AND AS LONG AS THE ELKHORN CORALS CAN'T MAKE IT ON THEIR OWN, WE'LL KEEP HELPING THEM.



OKAY, LOOKS LIKE THE SECOND VIAL IS NOW FULL.



I'VE GOT TO TAKE IT BACK TO THE BOAT AND THEN CHECK ON THE OTHER NETS WITH TOM. MAYBE WE'LL SEE YOU AGAIN IN A FEW MONTHS WHEN WE COME BACK TO PLANT MORE LITTLE CORALS.



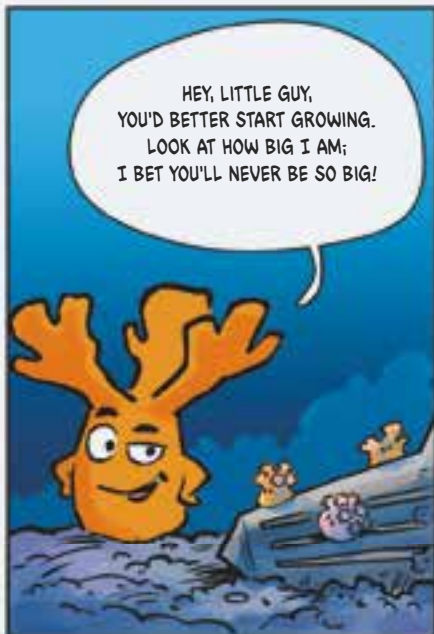
YEAH, THAT'S A GOOD IDEA. WE'VE GOT PLENTY OF ROOM.

WE'LL KEEP AN EYE ON THE BABIES, WE PROMISE!

THAT'S RIGHT; CORALS HELP ONE ANOTHER! AND THE SEA URCHINS ON OUR REEF CAN HELP WITH THOSE NASTY GREEN ALGAE- THEY JUST EAT THEM UP.



MUNCH

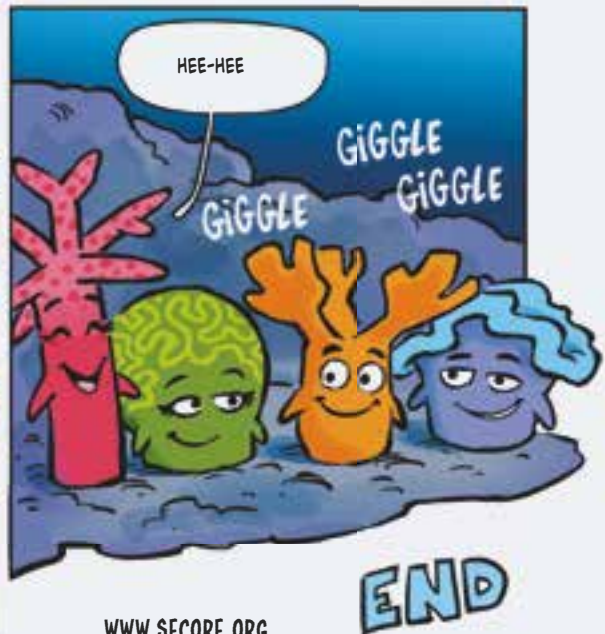


HEY, LITTLE GUY, YOU'D BETTER START GROWING. LOOK AT HOW BIG I AM; I BET YOU'LL NEVER BE SO BIG!



AL, STOP MESSING WITH THE LITTLE GUY. IF I REMEMBER RIGHT, THREE YEARS AGO YOU WERE JUST AS SMALL.

SPOILSPORT



HEE-HEE

GIGGLE GIGGLE

END



IMPRESSUM

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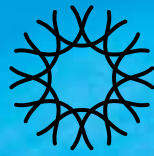
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