SPARK SQUAD

A STORY FROM THE NATIONAL LABORATORY OF THE ROCKIES

VOLUME 2

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A BRIEF INTRODUCTION TO ENERGY

HI! I'M POWER OFFICER GINA AND I'M HERE TO TALK ABOUT ENERGY!

WE USE ENERGY TO POWER ALMOST EVERYTHING IN OUR LIVES!

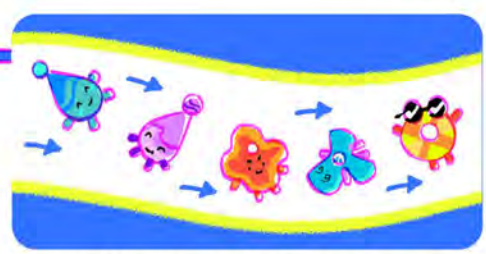
ENERGY COMES FROM ALL DIFFERENT KINDS OF PLACES

POWER OFFICERS AND THE SPARK SQUAD USE SPECIAL GOGGLES TO SEE ENERGY AS...

JOULES!

THE JOULES ARE PLAYFUL AND FULL OF ENERGY! WE USUALLY FIND THEM ENJOYING VARIOUS OUTDOOR ACTIVITIES

USING GENERATORS SUCH AS HYDROPOWER TURBINES, WE CAN CAPTURE THESE JOULES IN BATTERIES AND STORE THEIR ENERGY TO USE LATER!



WHEN WE'RE READY TO USE THE ENERGY FROM THE JOULES, THEY TRAVEL THROUGH WIRES...

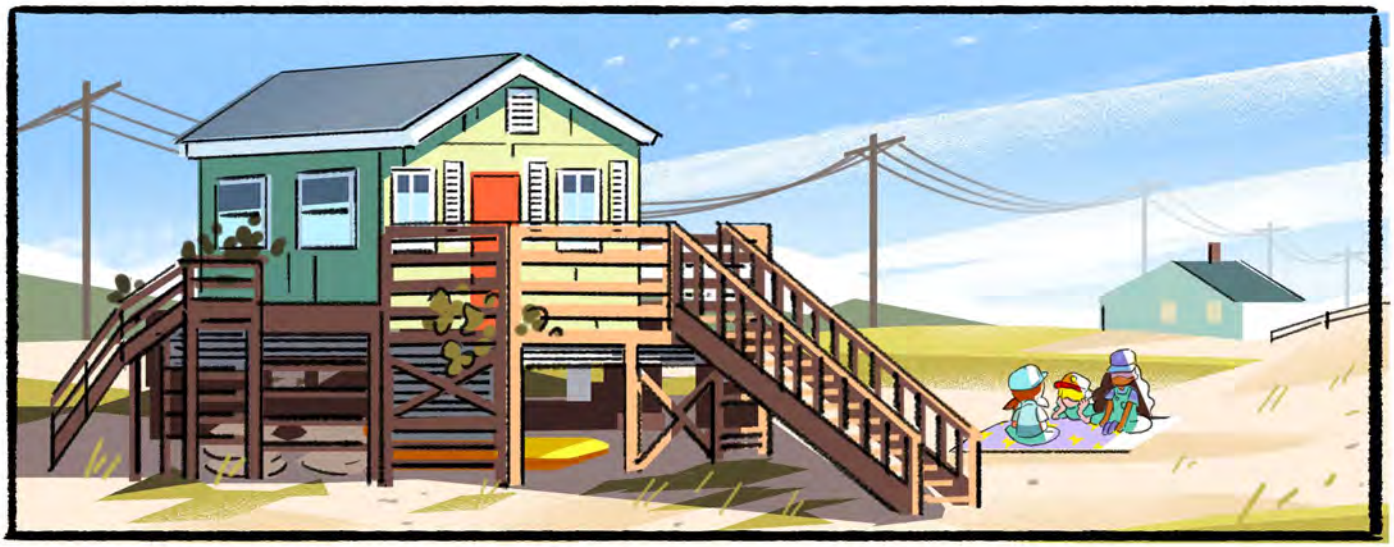
AND USE THEIR ENERGY AND EXCITEMENT TO POWER OUR DEVICES!

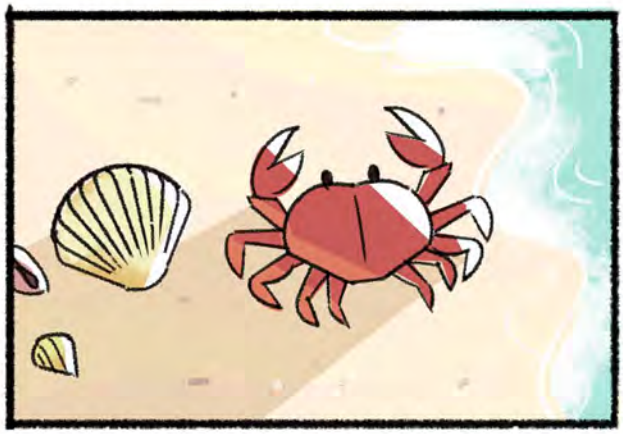
ONCE A JOULE HAS BEEN USED TO POWER SOMETHING, IT GETS REALLY TIRED...

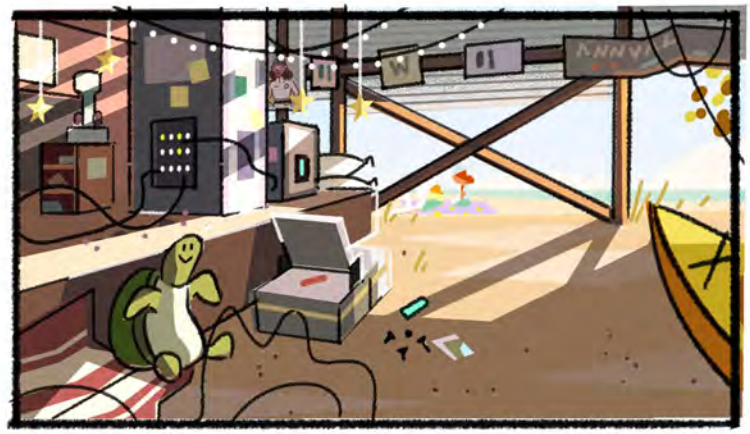
BUT AFTER A REST, THE JOULE RETURNS TO DOING WHAT IT LOVES TO DO!

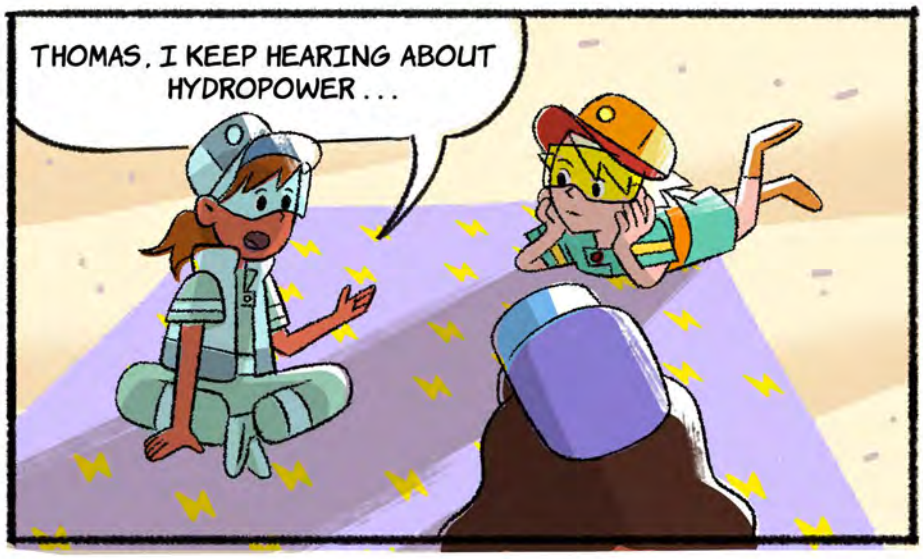
THEN THE WHOLE PROCESS CAN START AGAIN!

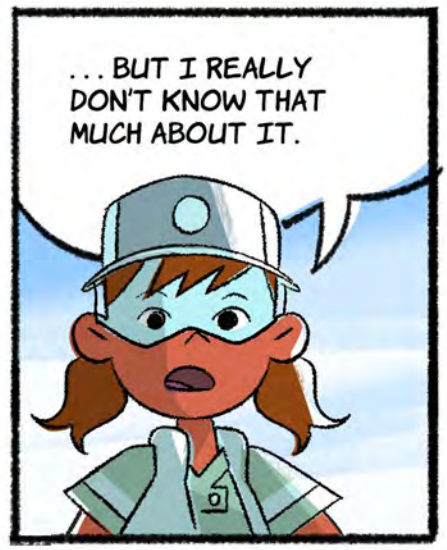
IF YOU THINK YOU WOULD LIKE TO LEARN MORE ABOUT ENERGY AND JOULES, CONSIDER JOINING THE SPARK SQUAD!



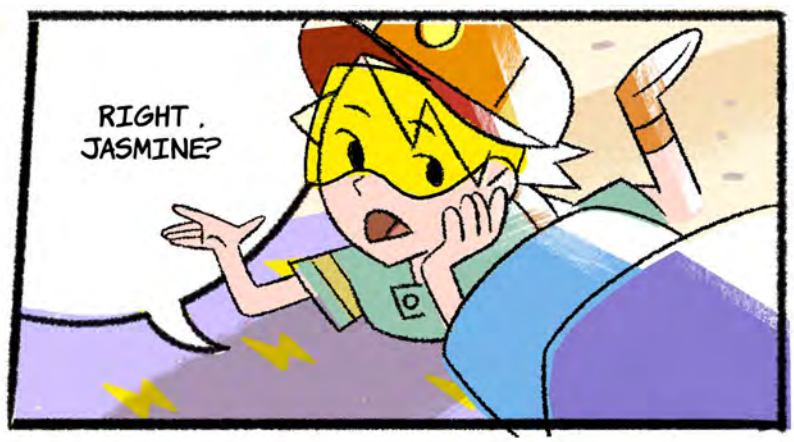





THOMAS, I KEEP HEARING ABOUT HYDROPOWER . . .


. . . BUT I REALLY DON'T KNOW THAT MUCH ABOUT IT.

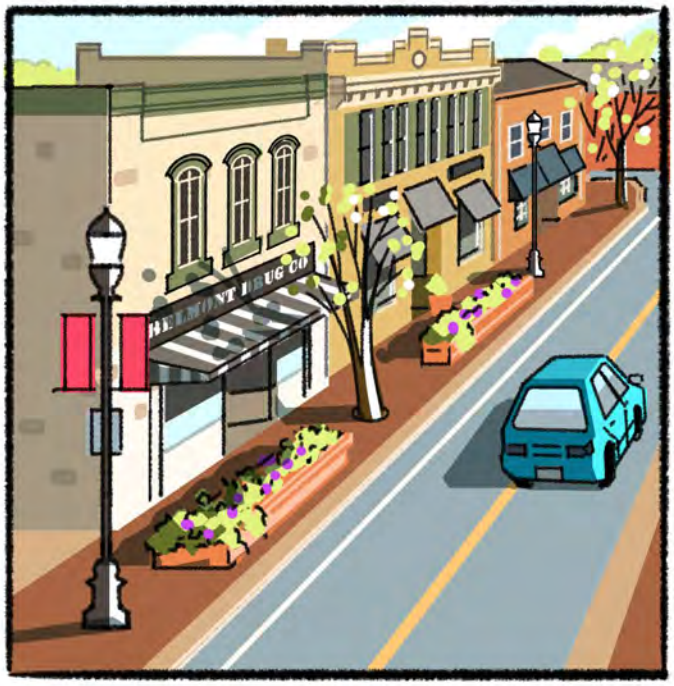
ME NEITHER, ARIA. IT HAS TO BE MORE THAN JUST A DAM . . .


RIGHT, JASMINE?

HYDROPOWER ALSO . . .
UH . . .
AH . . . HEY, YOU'RE ASHER, RIGHT? HOW LONG HAVE YOU BEEN STANDING THERE?
I WAS JUST OVER THERE LOOKING AT THE CRABS AND SEASHELLS . . .
AND HAPPENED TO OVERHEAR YOU TALKING.

YOU MENTIONED HYDROPOWER
AND MY UNCLE WORKS IN HYDRO.
AND SAYS IT'S AN AWESOME JOB.
OH REALLY! DOES HE WORK AT A DAM?
HE SURE DOES! I THINK IT'S IN GEORGIA . . .
MAYBE WE COULD ALL GO VISIT THERE AND CHECK IT OUT?
REALLY??
THAT MEANS . . .
ROAD TRIP!
I'LL ASK MY MOM TO DRIVE!

AND SO . . . THE SPARK SQUAD SET OUT TO RUSSELL DAM AND LAKE!
WOW
HEY! WE'VE OFFICIALLY LEFT NORTH CAROLINA!



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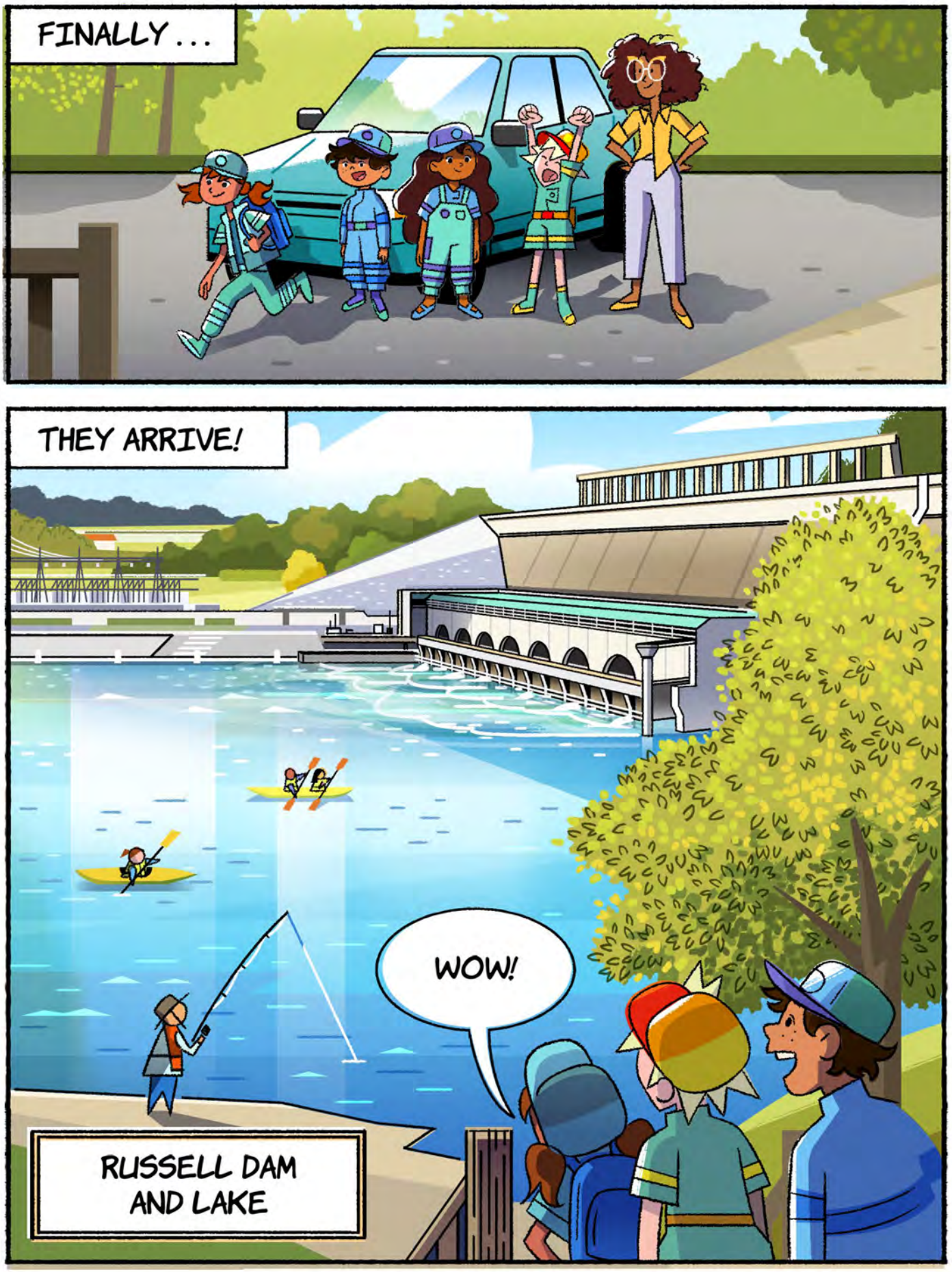
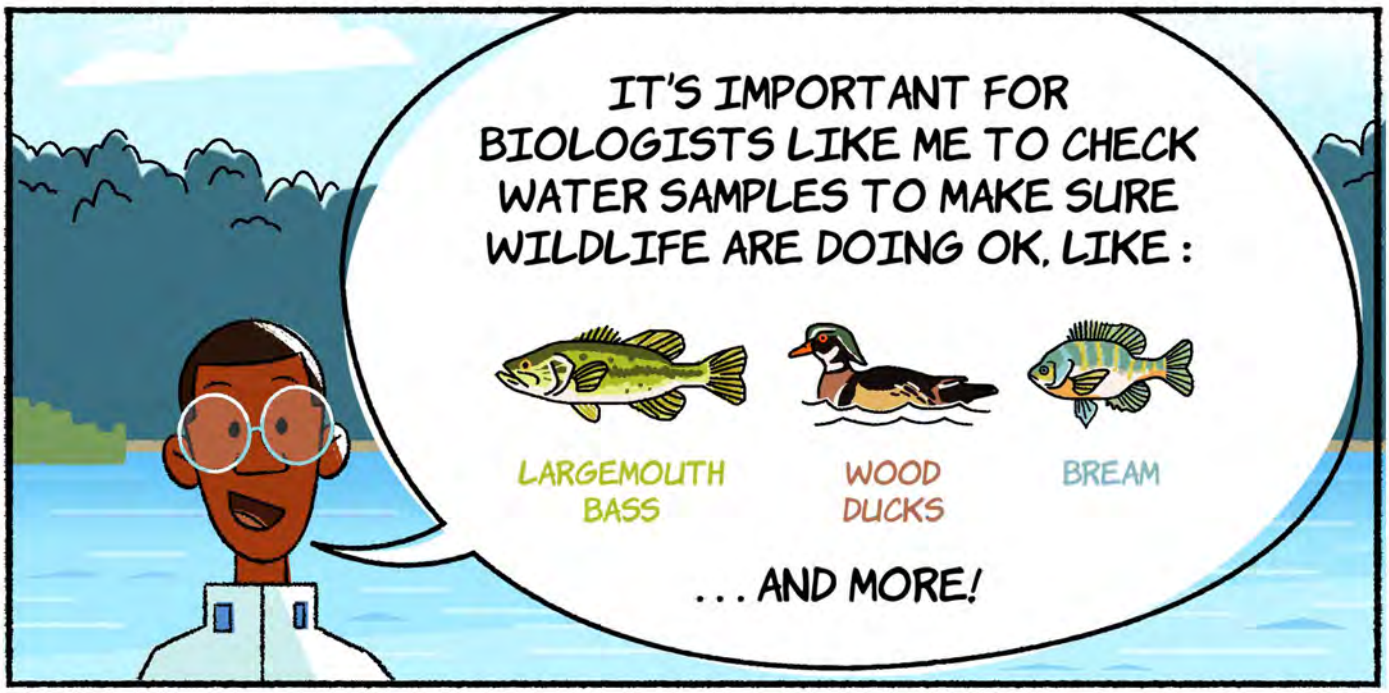
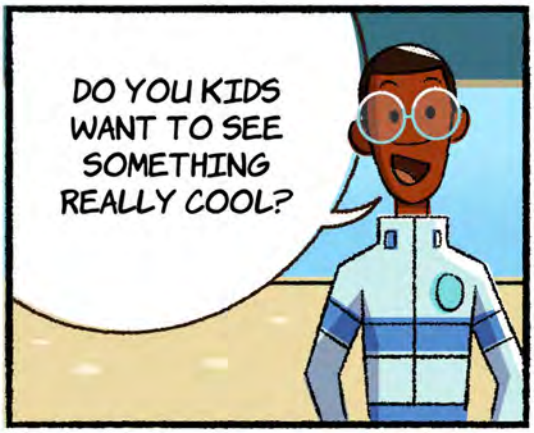
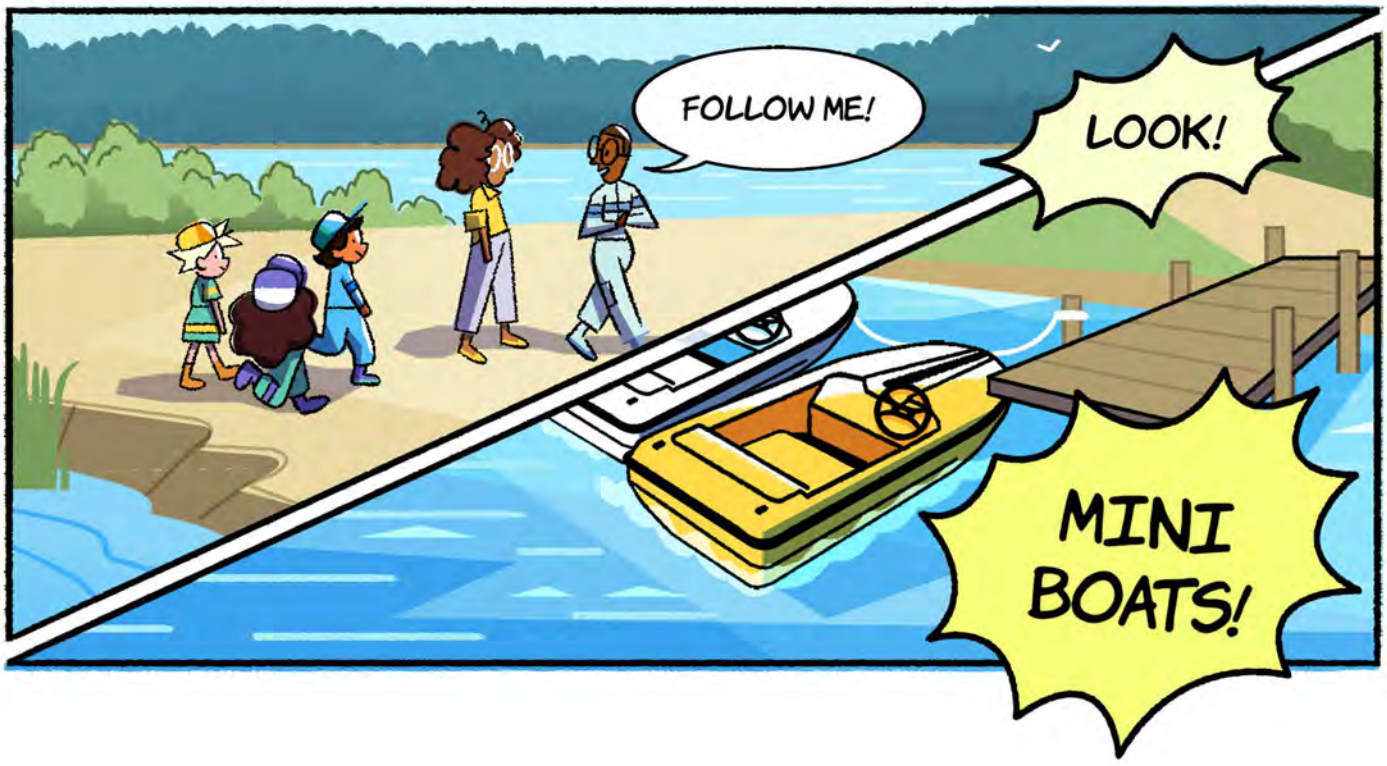

FINALLY . . .
THEY ARRIVE!
WOW!
RUSSELL DAM AND LAKE

FRANK!
HEY!
THIS IS MY UNCLE FRANK!
ASHER! HEY THERE. YOU ACTUALLY CAUGHT ME COLLECTING WATER SAMPLES.
OH REALLY. WHAT ARE YOU DOING THAT FOR?

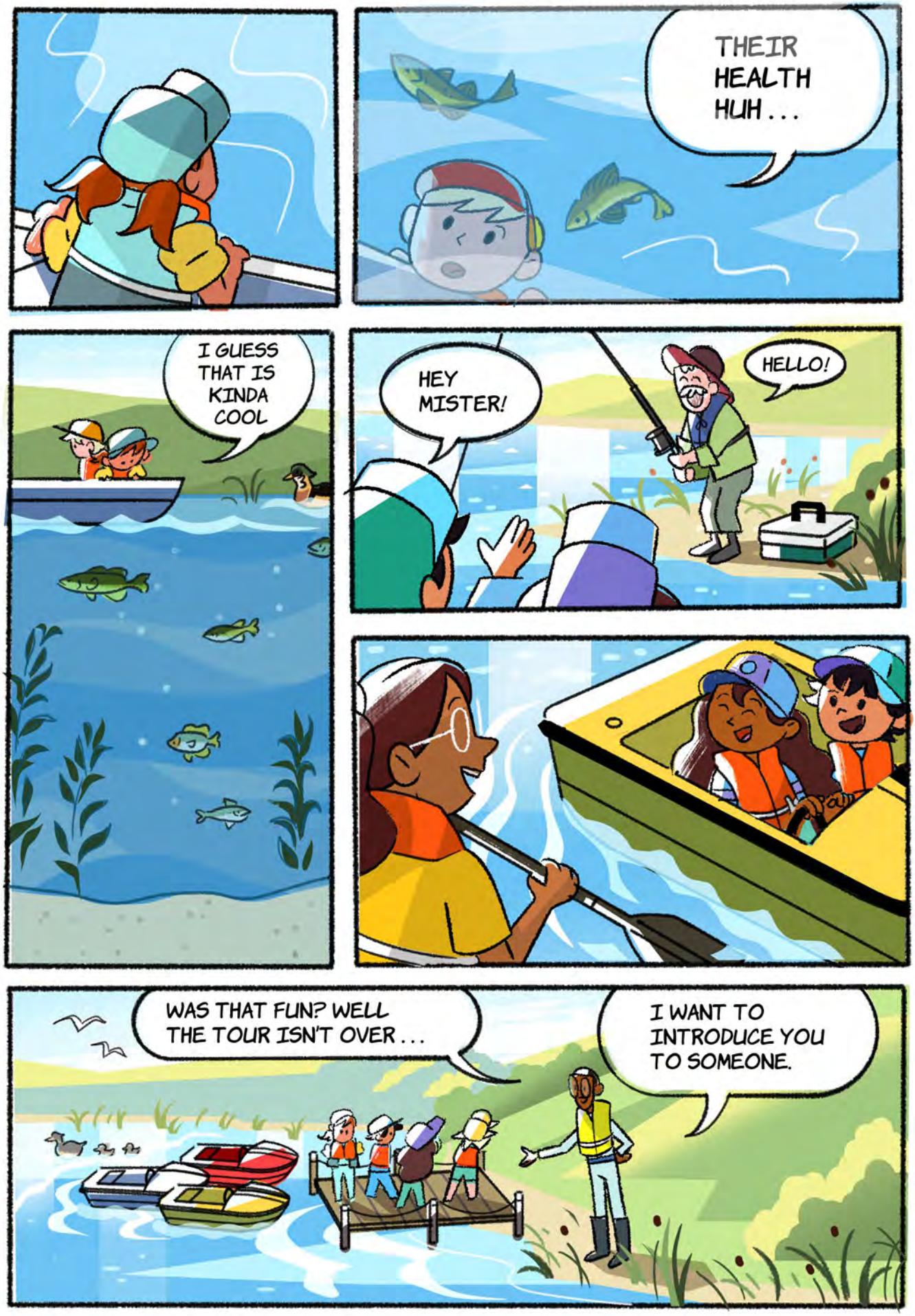

IT'S IMPORTANT FOR BIOLOGISTS LIKE ME TO CHECK WATER SAMPLES TO MAKE SURE WILDLIFE ARE DOING OK, LIKE :
LARGEMOUTH BASS
WOOD DUCKS
BREAM
. . . AND MORE!

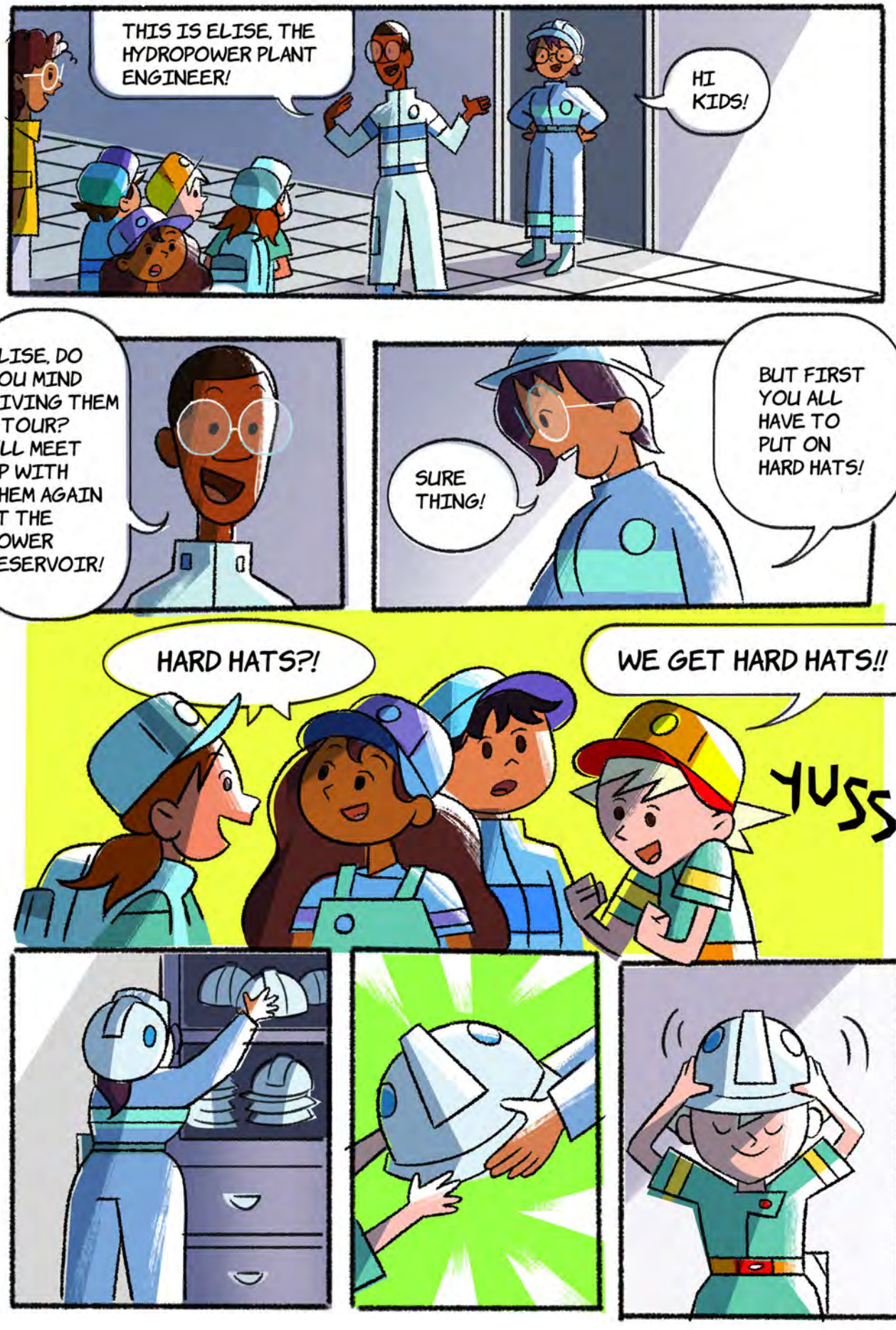

DO YOU KIDS WANT TO SEE SOMETHING REALLY COOL?

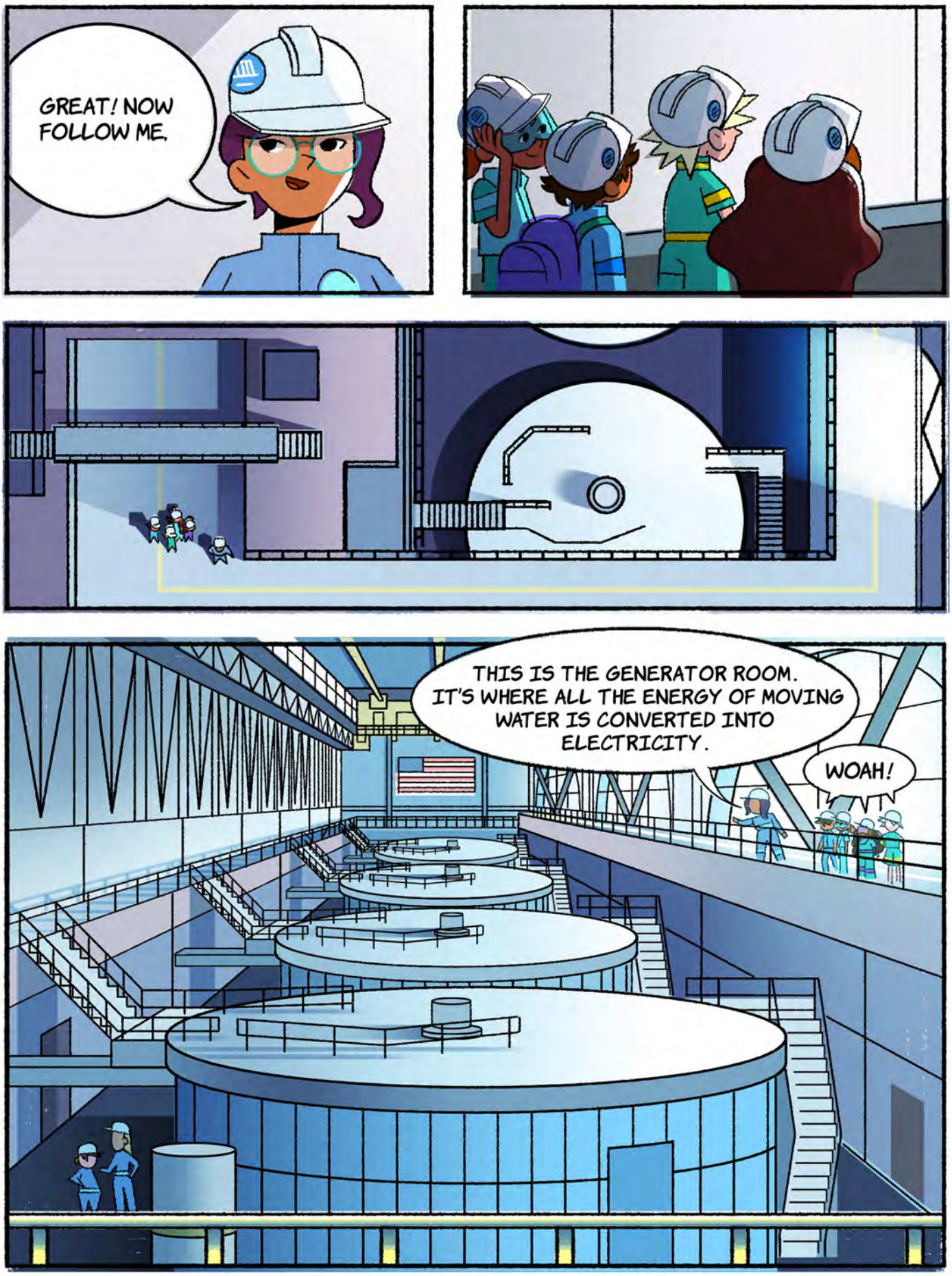
COOLER THAN THIS?!

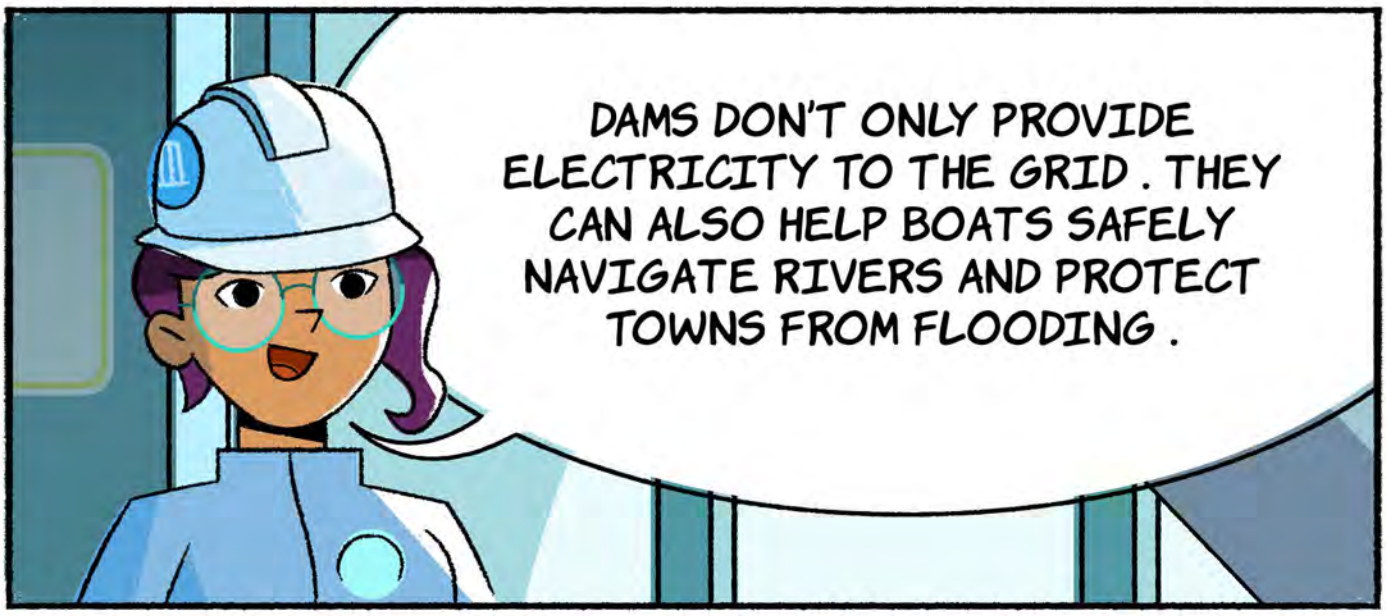

FOLLOW ME!
LOOK!
MINI BOATS!

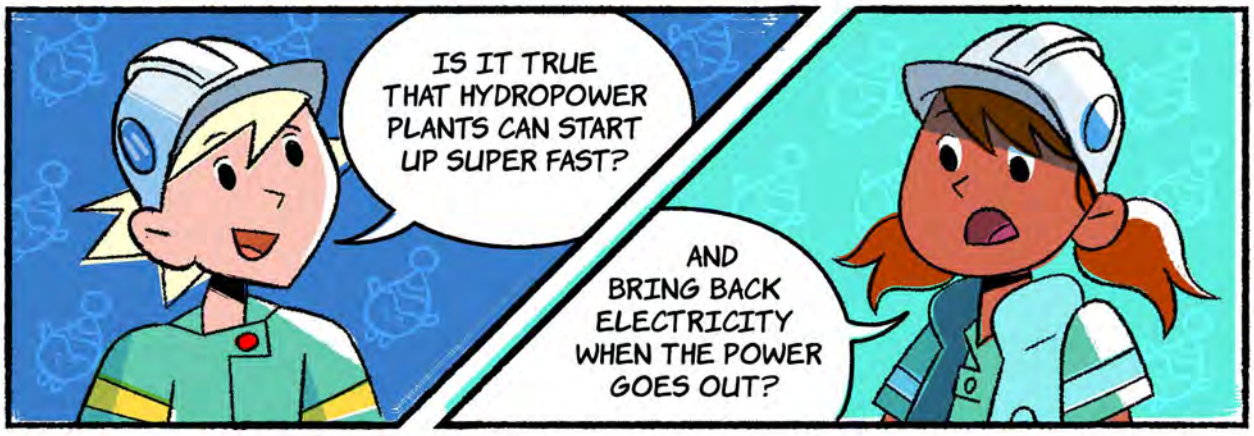
WHAAT!!
COOL!
PFFFF
OKAY . . .
READY . . .
PRETTY COOL, RIGHT? SOMETIMES MY JOB INCLUDES CATCHING
AND RELEASING THESE FISH TO MAKE SURE THEY'RE DOING OK.

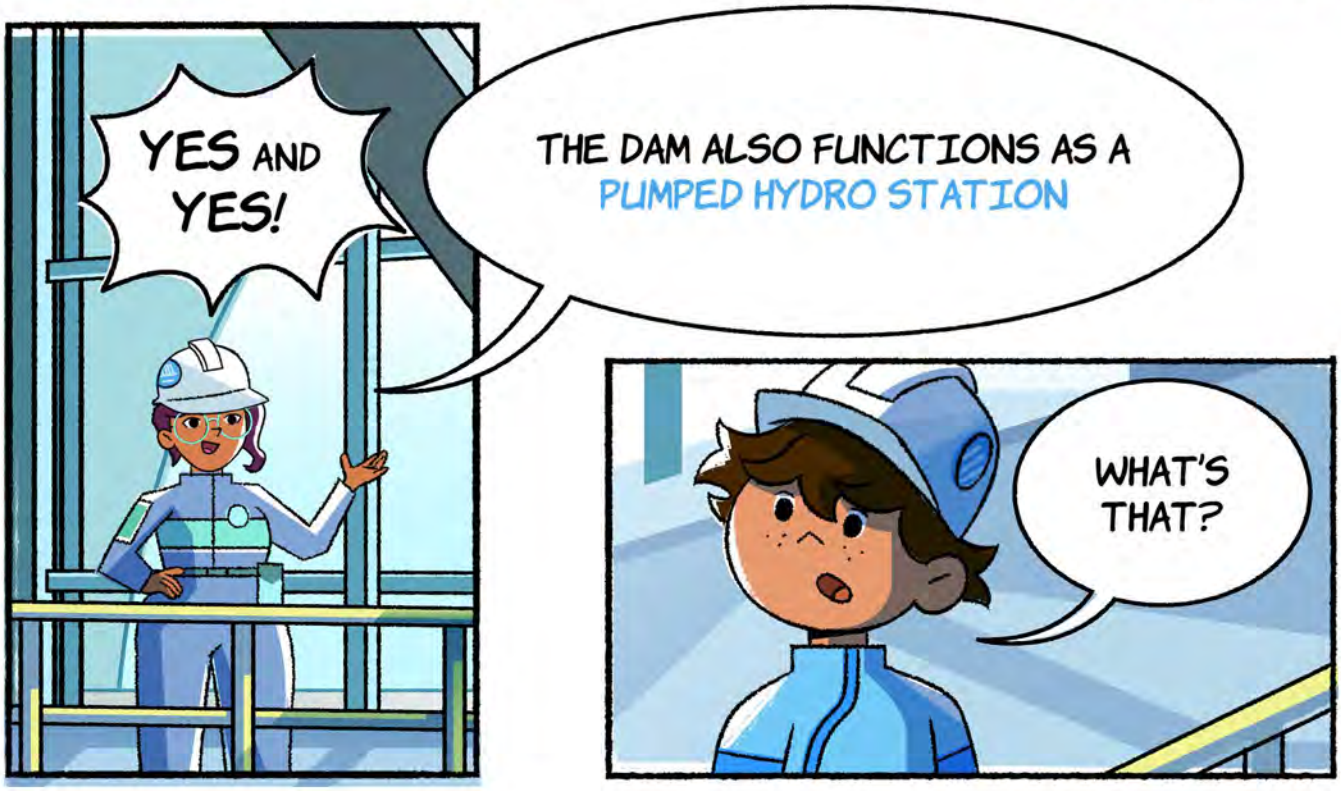

THEIR HEALTH HUH . . .
I GUESS THAT IS KINDA COOL
HEY MISTER!
HELLO!
WAS THAT FUN? WELL THE TOUR ISN'T OVER . . .
I WANT TO INTRODUCE YOU TO SOMEONE.

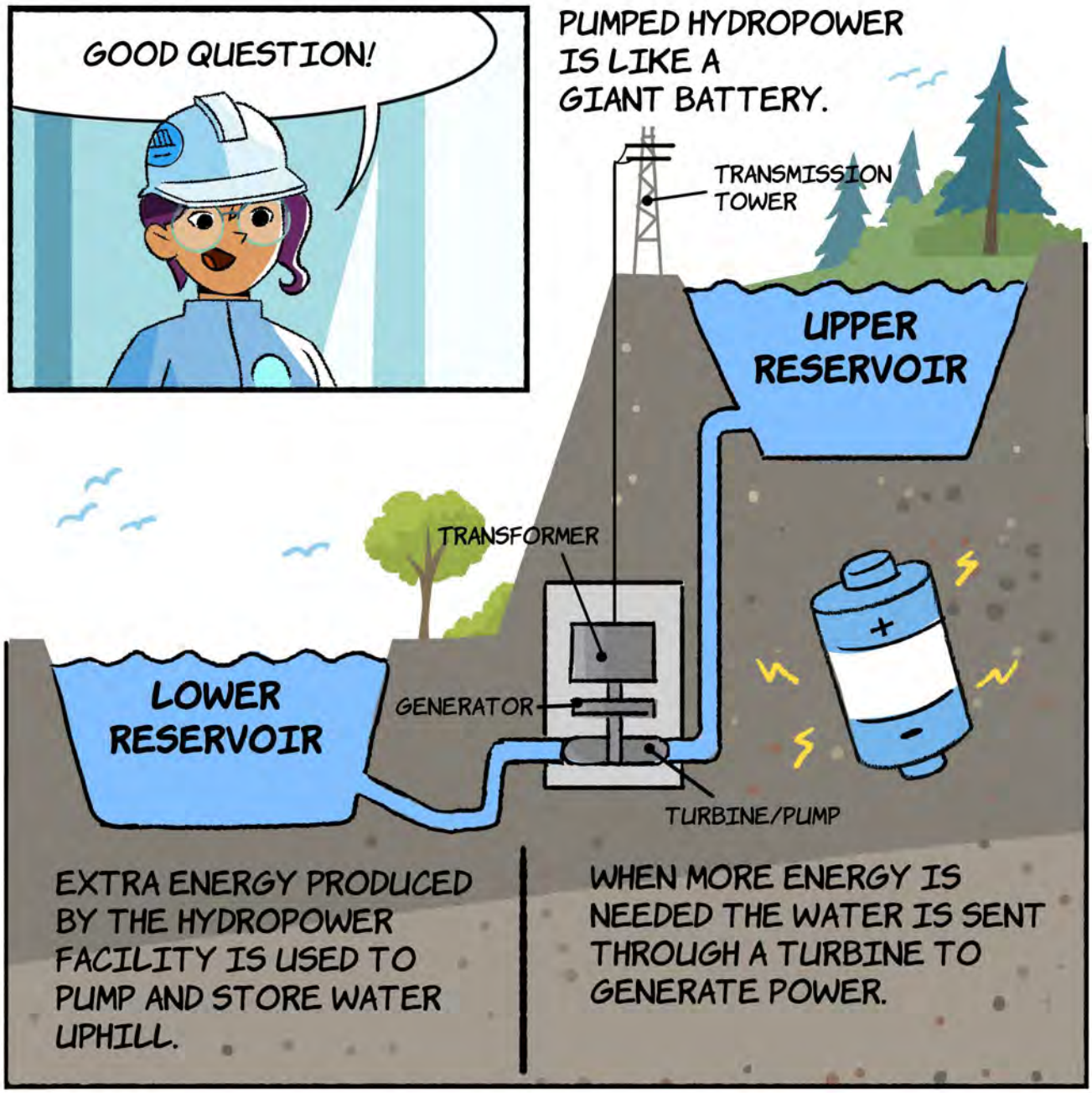

THIS IS ELISE, THE HYDROPOWER PLANT ENGINEER!
HI KIDS!
ELISE, DO YOU MIND GIVING THEM A TOUR? I'LL MEET UP WITH THEM AGAIN AT THE LOWER RESERVOIR!
SURE THING!
BUT FIRST YOU ALL HAVE TO PUT ON HARD HATS!
HARD HATS?!
WE GET HARD HATS!!
YUSS!

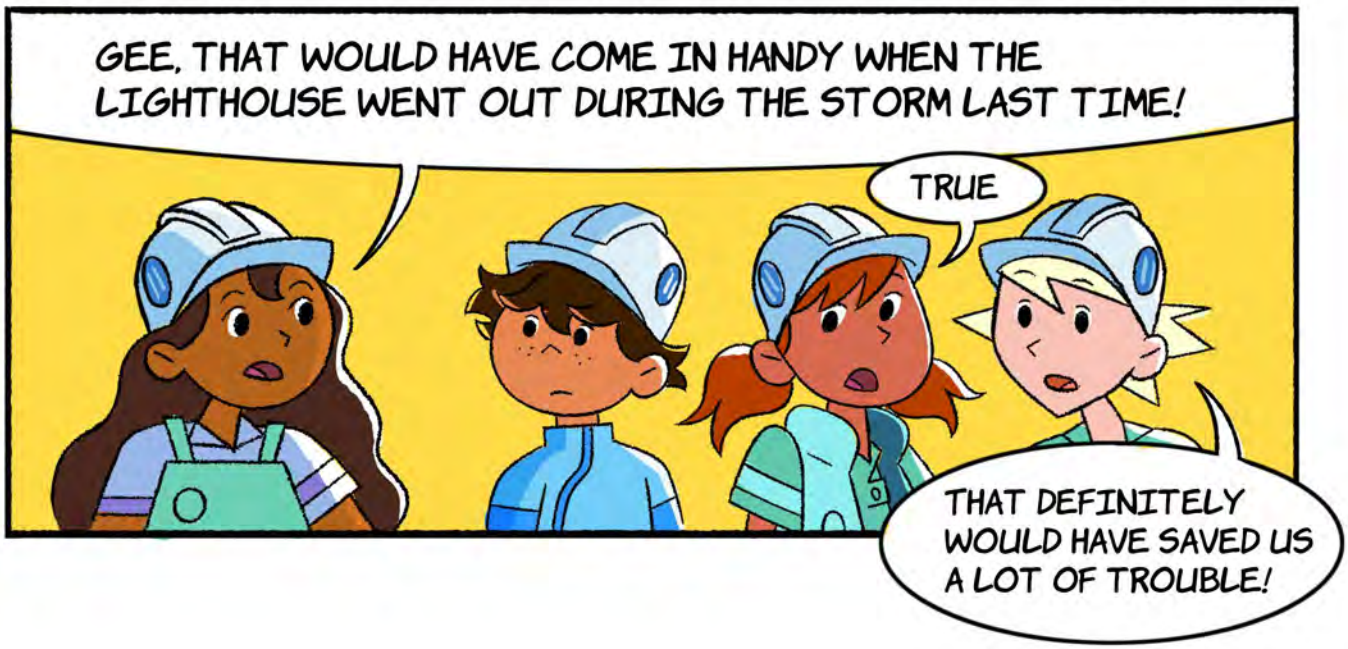

GREAT! NOW FOLLOW ME.
THIS IS THE GENERATOR ROOM. IT'S WHERE ALL THE ENERGY OF MOVING WATER IS CONVERTED INTO ELECTRICITY.
WOAH!

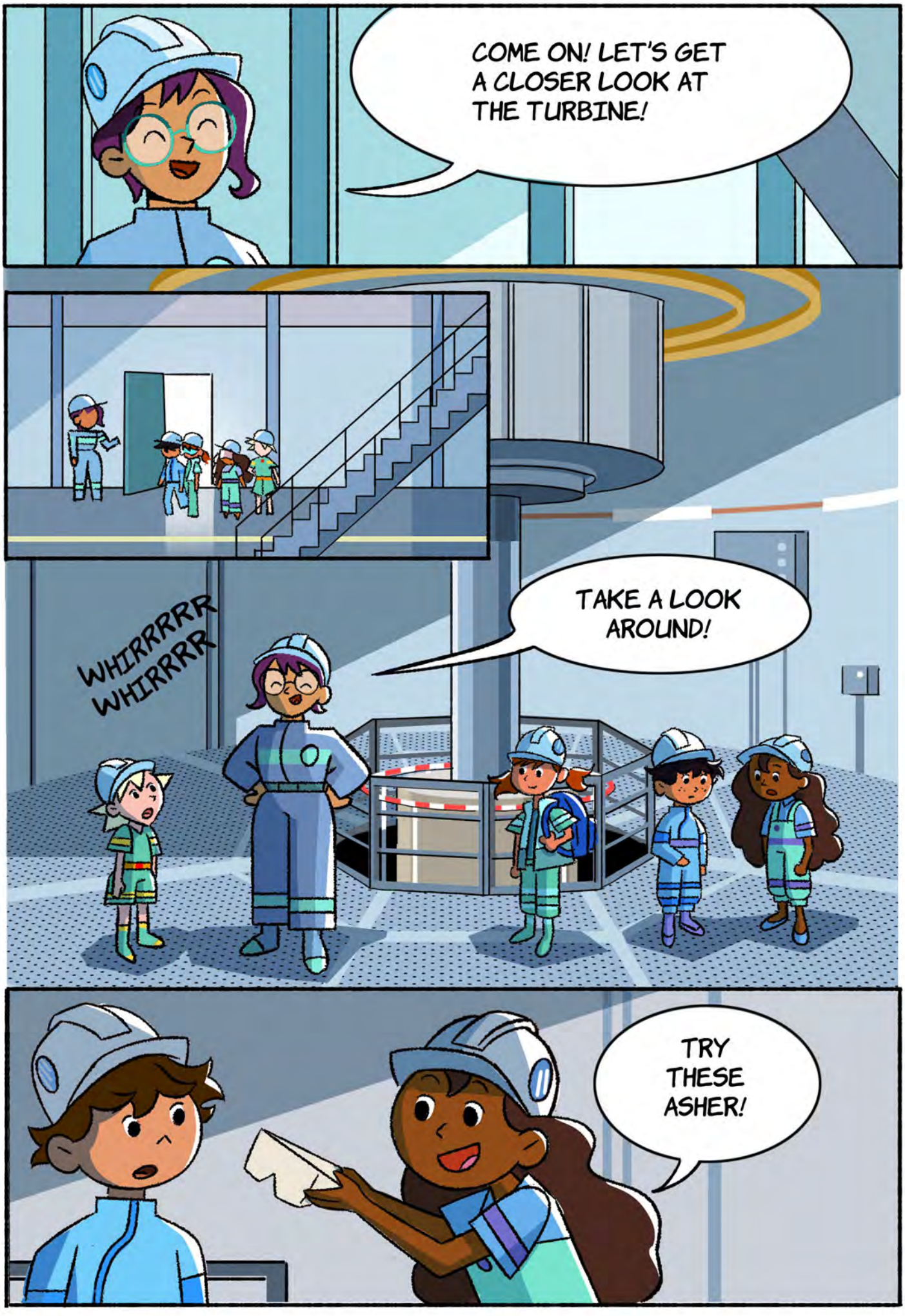

DAMS DON'T ONLY PROVIDE ELECTRICITY TO THE GRID . THEY CAN ALSO HELP BOATS SAFELY NAVIGATE RIVERS AND PROTECT TOWNS FROM FLOODING .

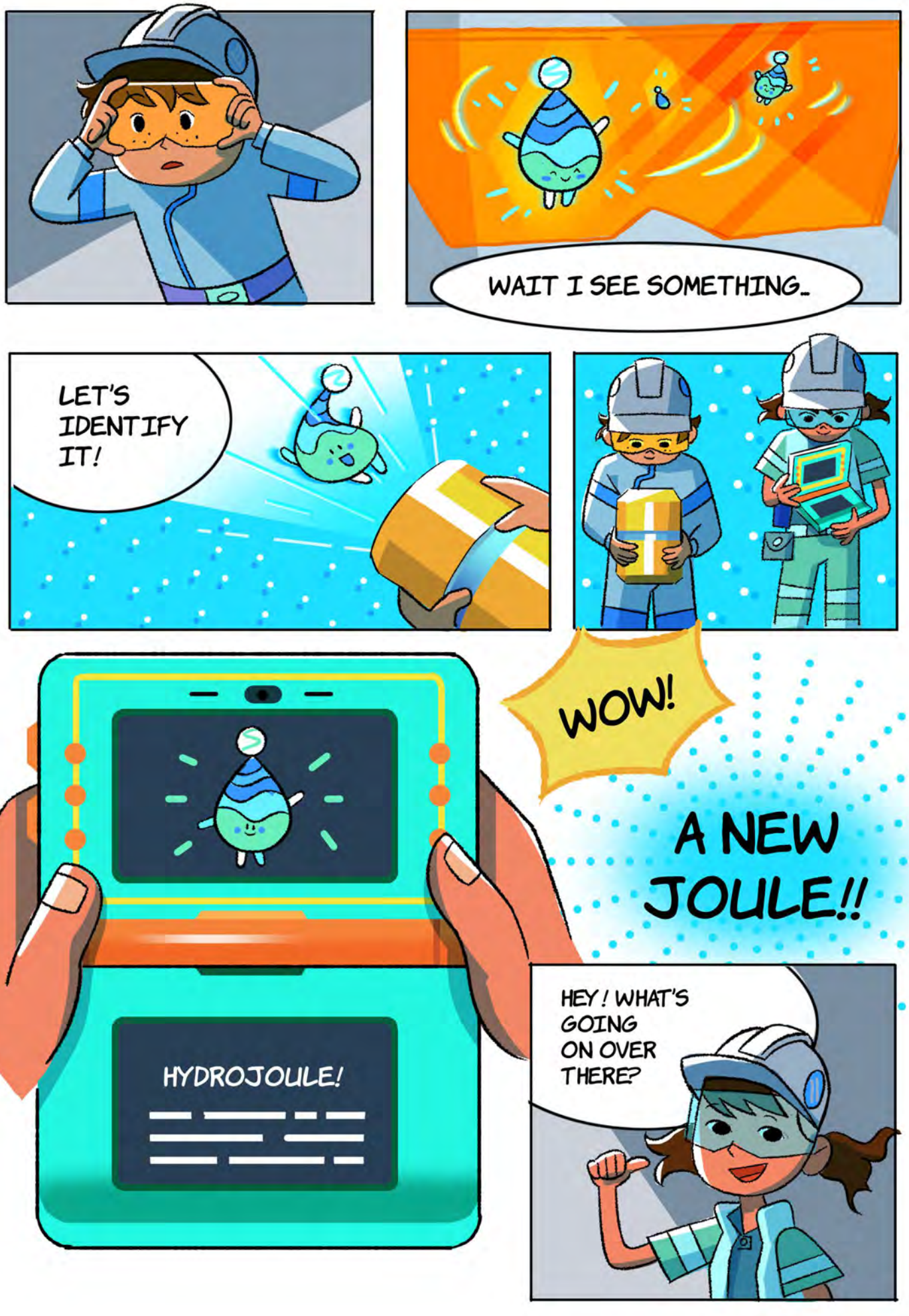

IS IT TRUE THAT HYDROPOWER PLANTS CAN START UP SUPER FAST?
AND BRING BACK ELECTRICITY WHEN THE POWER GOES OUT?

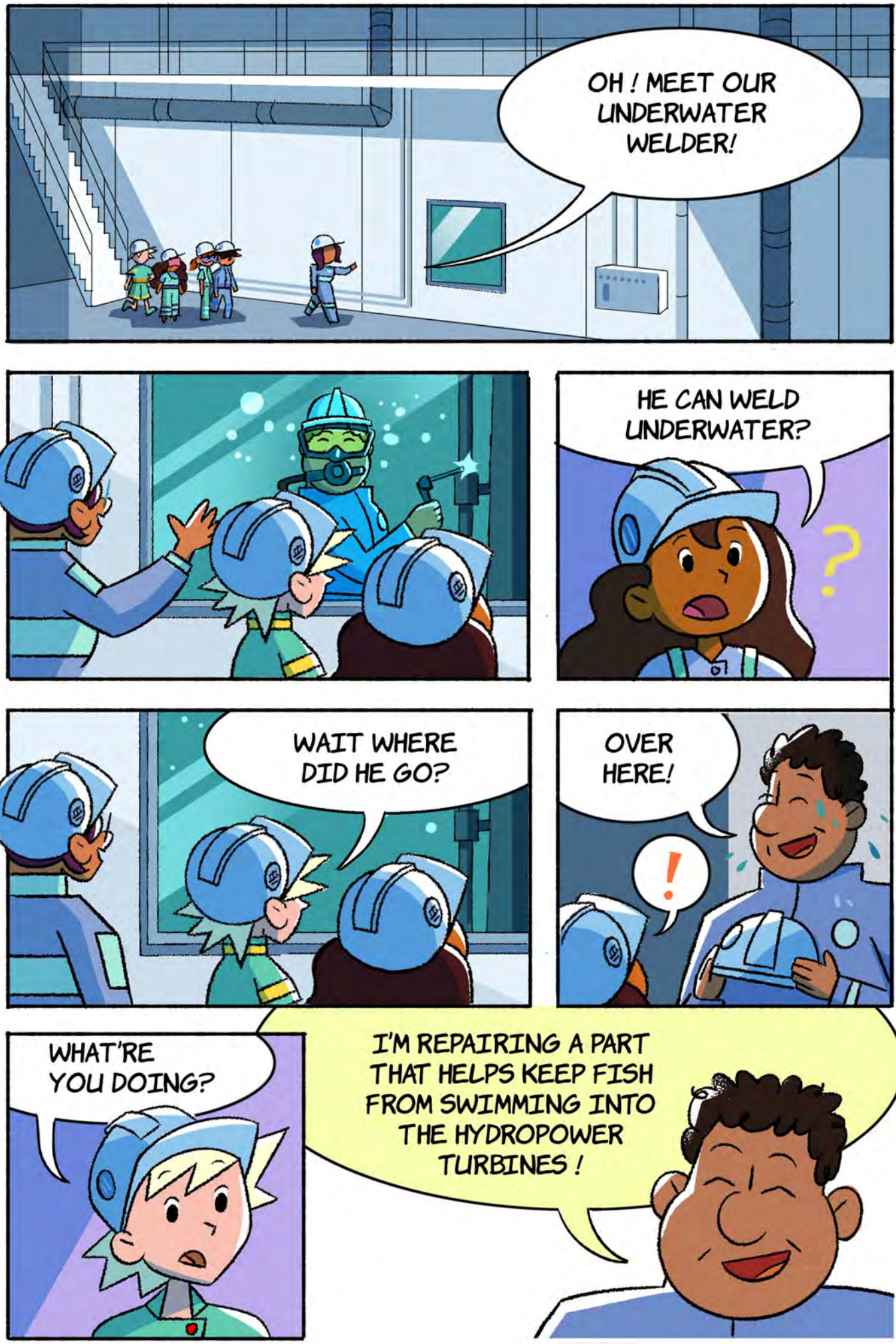

YES AND YES!
THE DAM ALSO FUNCTIONS AS A PUMPED HYDRO STATION
WHAT'S THAT?


GOOD QUESTION!
PUMPED HYDROPOWER IS LIKE A GIANT BATTERY.
TRANSMISSION TOWER
UPPER RESERVOIR
TRANSFORMER
LOWER RESERVOIR
GENERATOR
TURBINE/PUMP
EXTRA ENERGY PRODUCED BY THE HYDROPOWER FACILITY IS USED TO PUMP AND STORE WATER UPHILL.
WHEN MORE ENERGY IS NEEDED THE WATER IS SENT THROUGH A TURBINE TO GENERATE POWER.

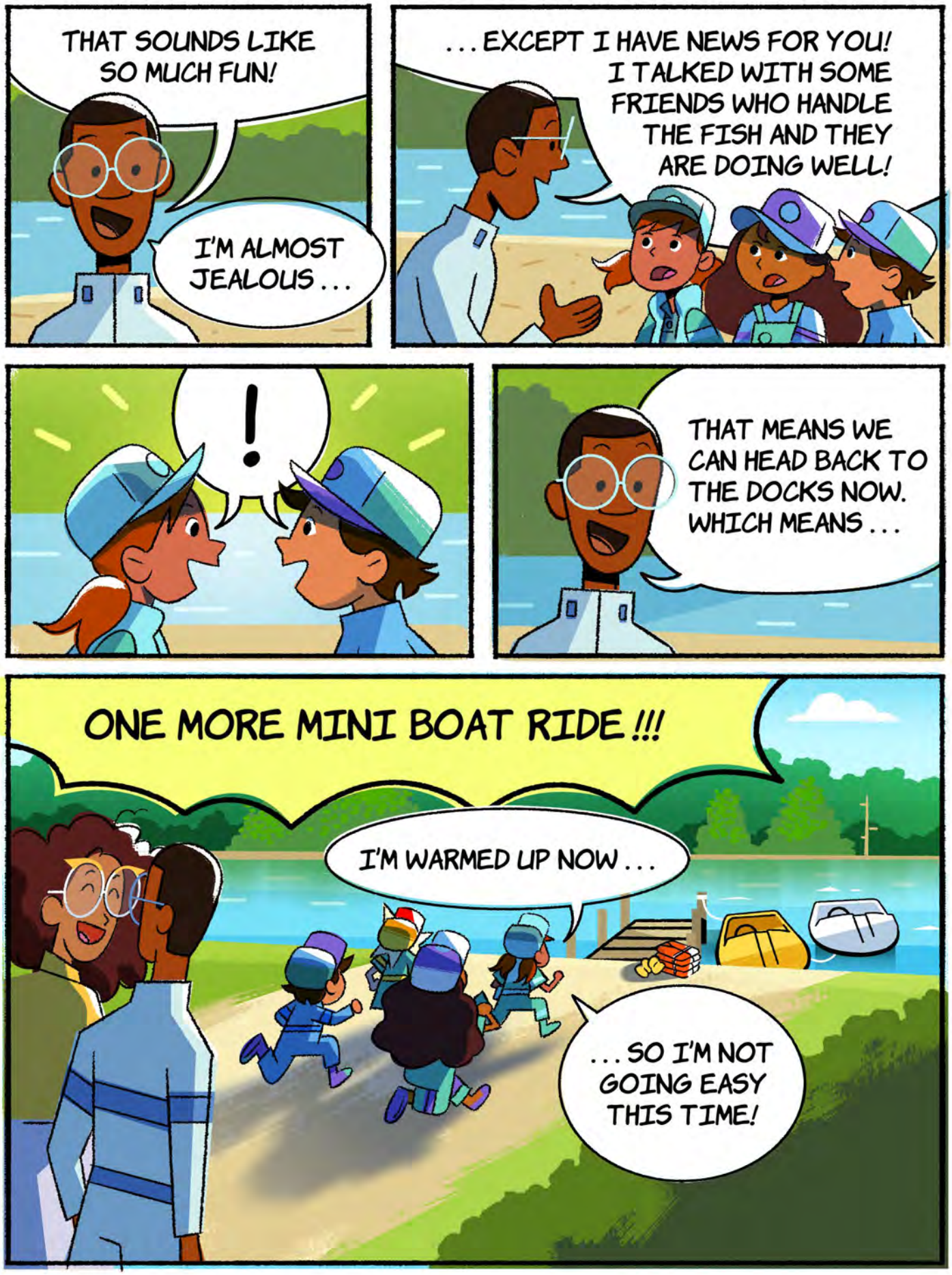

GEE, THAT WOULD HAVE COME IN HANDY WHEN THE LIGHTHOUSE WENT OUT DURING THE STORM LAST TIME!
TRUE
THAT DEFINITELY WOULD HAVE SAVED US A LOT OF TROUBLE!

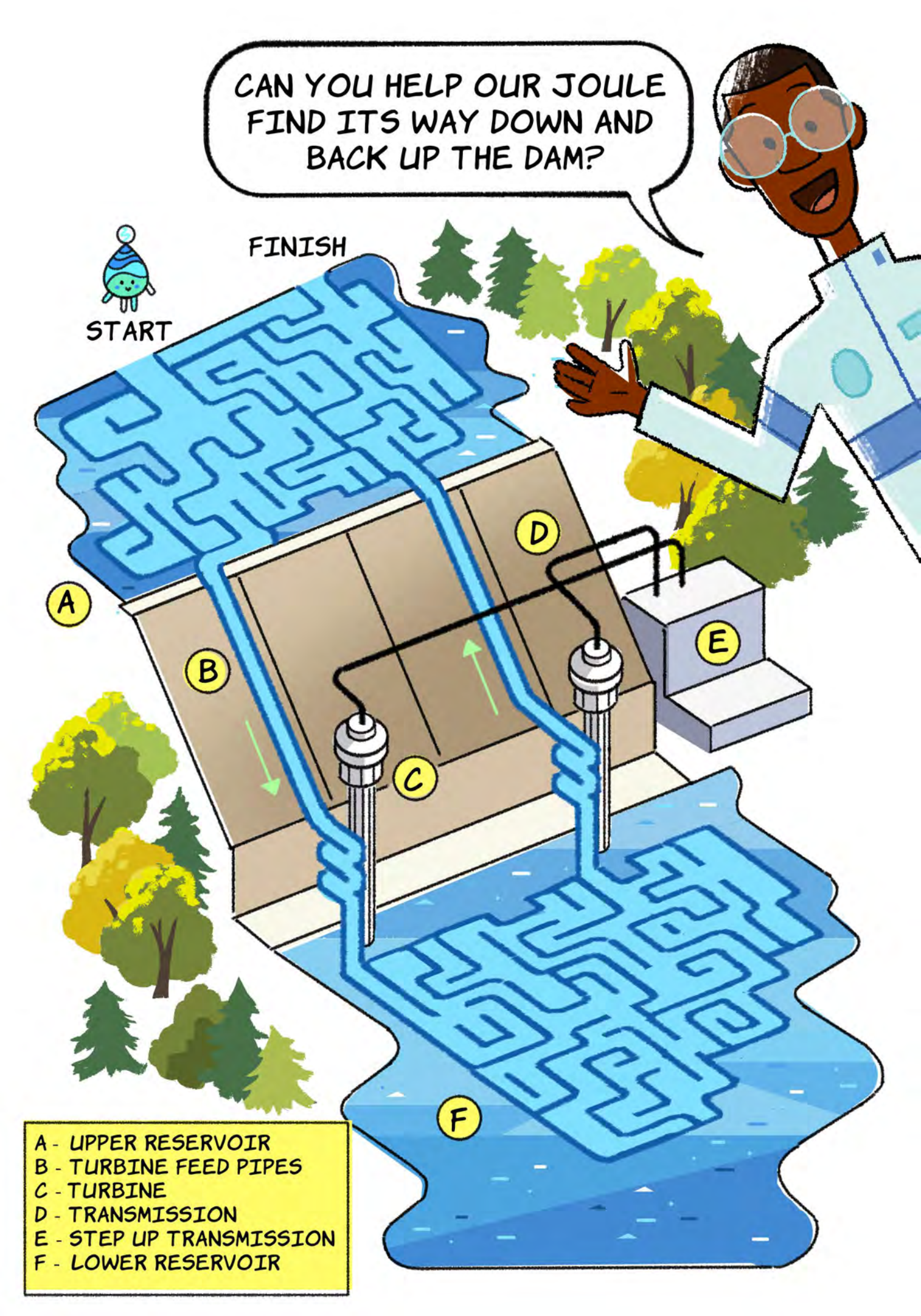

COME ON! LET'S GET A CLOSER LOOK AT THE TURBINE!
WHIRRRRR WHIRRRR
TAKE A LOOK AROUND!
TRY THESE ASHER!

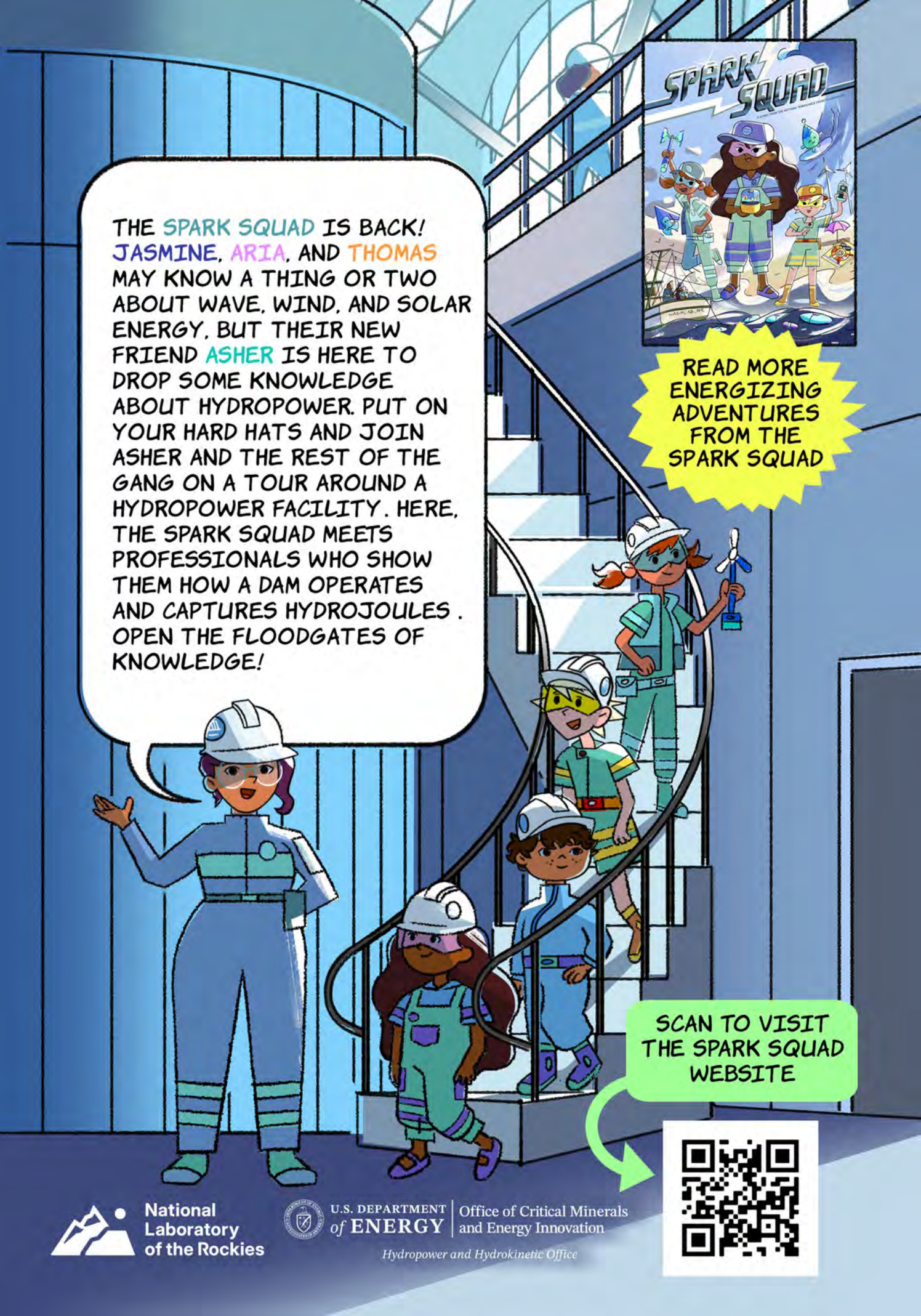

WAIT I SEE SOMETHING..
LET'S IDENTIFY IT!
WOW!
A NEW JOULE!!
HYDROJOULE!
HEY! WHAT'S GOING ON OVER THERE?


OH ! MEET OUR UNDERWATER WELDER!
HE CAN WELD UNDERWATER?
?
WAIT WHERE DID HE GO?
OVER HERE!
!
WHAT'RE YOU DOING?
I'M REPAIRING A PART THAT HELPS KEEP FISH FROM SWIMMING INTO THE HYDROPOWER TURBINES !

MY UNCLE WORKS WITH THE FISH HERE!
UNCLE FRANK? SURE I KNOW HIM! HE AND I GO WAYYY BACK. HE'S ONE OF THE BEST!
SPEAKING OF UNCLE FRANK, WE SHOULD GO MEET HIM NOW.
AT THE LOWER RESERVOIR . . .
UNCLE FRANK!
DID YOU HAVE FUN?
YES! WE SAW A WELDER!
WE FOUND A NEW JOULE!
WE GOT A TOUR OF THE GENERATOR ROOM!


THAT SOUNDS LIKE SO MUCH FUN!
I'M ALMOST JEALOUS . . .
. . . EXCEPT I HAVE NEWS FOR YOU! I TALKED WITH SOME FRIENDS WHO HANDLE THE FISH AND THEY ARE DOING WELL!
!
THAT MEANS WE CAN HEAD BACK TO THE DOCKS NOW. WHICH MEANS . . .
ONE MORE MINI BOAT RIDE !!!
I'M WARMED UP NOW . . .
. . . SO I'M NOT GOING EASY THIS TIME!


CAN YOU HELP OUR JOULE FIND ITS WAY DOWN AND BACK UP THE DAM?
FINISH
START
A
B
C
D
E
F
A - UPPER RESERVOIR
B - TURBINE FEED PIPES
C - TURBINE
D - TRANSMISSION
E - STEP UP TRANSMISSION
F - LOWER RESERVOIR


THE SPARK SQUAD IS BACK! JASMINE, ARIA, AND THOMAS MAY KNOW A THING OR TWO ABOUT WAVE, WIND, AND SOLAR ENERGY, BUT THEIR NEW FRIEND ASHER IS HERE TO DROP SOME KNOWLEDGE ABOUT HYDROPOWER. PUT ON YOUR HARD HATS AND JOIN ASHER AND THE REST OF THE GANG ON A TOUR AROUND A HYDROPOWER FACILITY. HERE, THE SPARK SQUAD MEETS PROFESSIONALS WHO SHOW THEM HOW A DAM OPERATES AND CAPTURES HYDROJOULES. OPEN THE FLOODGATES OF KNOWLEDGE!
SPARK SQUAD
READ MORE ENERGIZING ADVENTURES FROM THE SPARK SQUAD
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