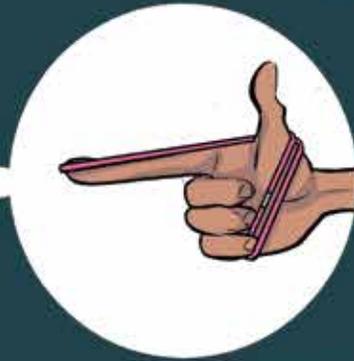
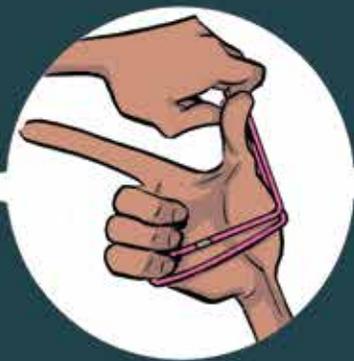
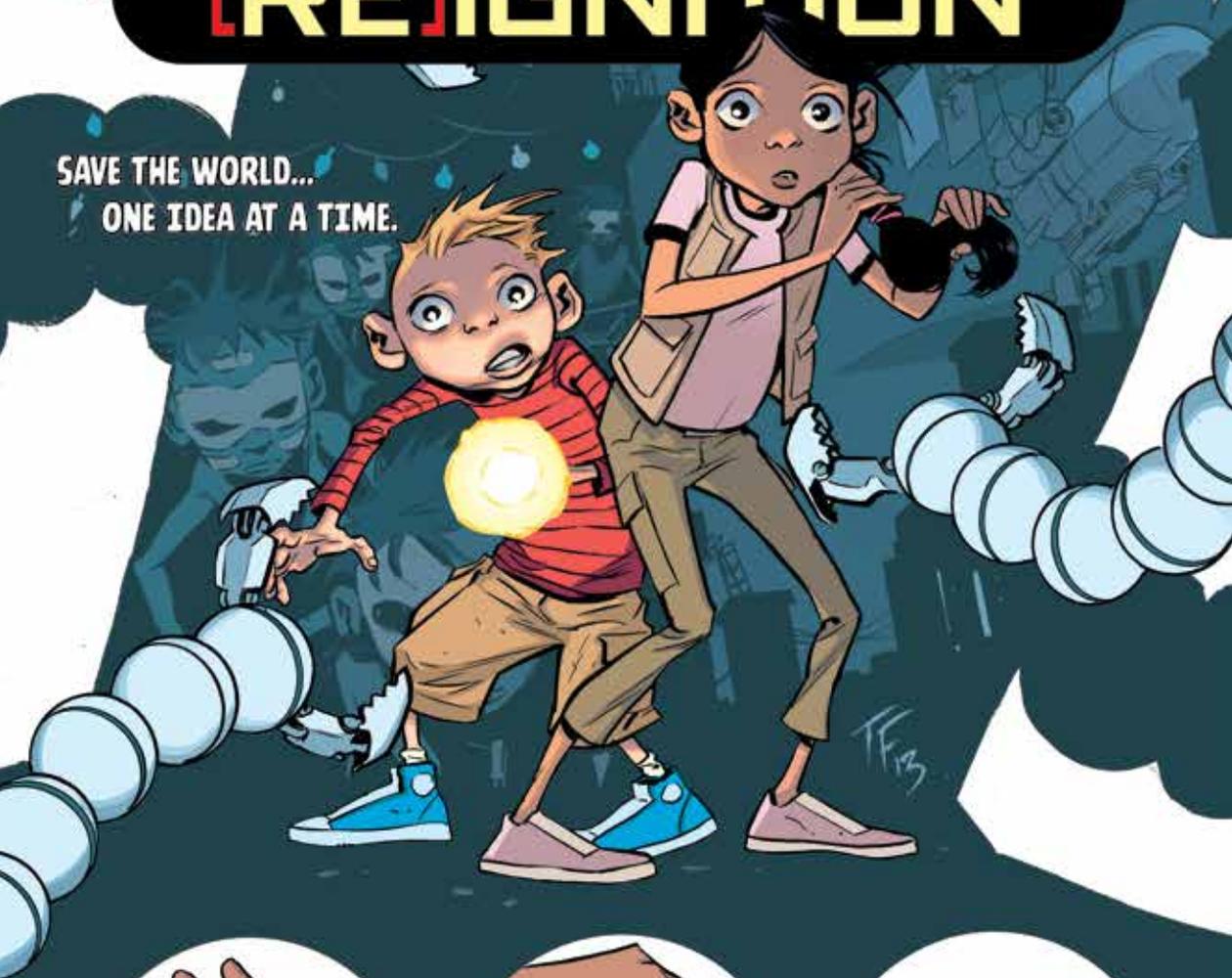


HOWTOONS

[RE]IGNITION

SAVE THE WORLD...
ONE IDEA AT A TIME.



VAN LENTE
FOWLER
BELLAIRE



HOWTOONS [RE]IGNITION

No. 1

HOWTOONS created by *Dr. Saul Griffith, Nick Dragotta, & Joost Bensen.*

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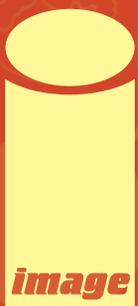


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PROLOGUE:

[PRE]IGNITION

WHERE?

92,960,000 MILES AWAY.*

WHEN?

EIGHT MINUTES AGO!

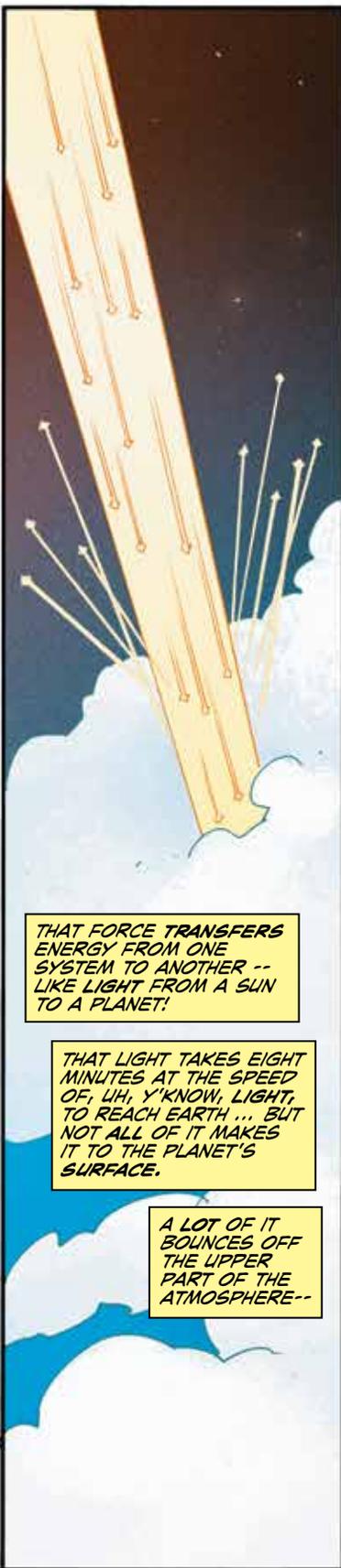
WHAT?!?!

* OR 149,600,000 KILOMETERS.

Energy, THAT'S WHAT --
THE ABILITY OF A SYSTEM
TO DO WORK!

"WORK" IN THIS INSTANCE
IS EXERTING FORCE ON
ANOTHER SYSTEM FROM
A DISTANCE --

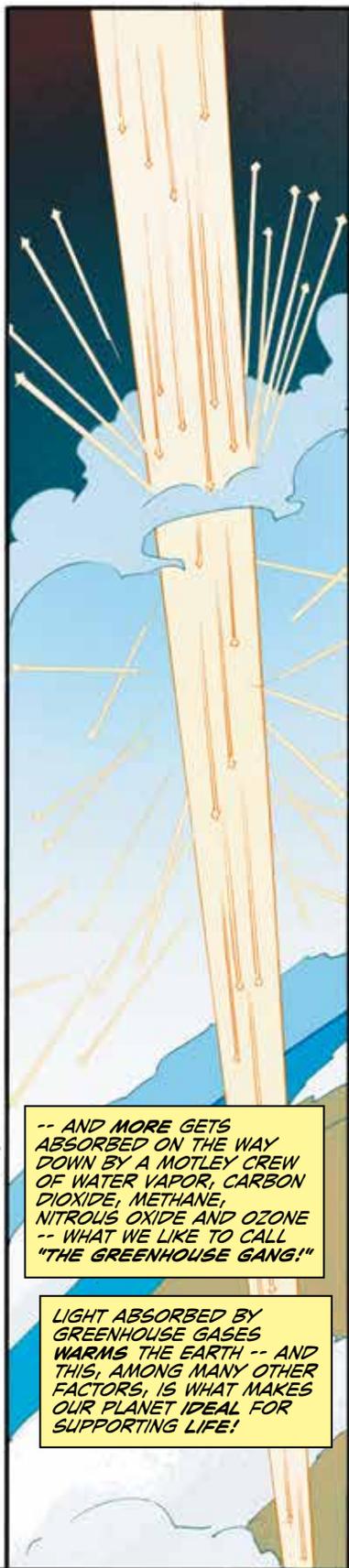
-- EVEN A HUGE
DISTANCE LIKE THAT
BETWEEN EARTH
AND OUR SUN!



THAT FORCE TRANSFERS
ENERGY FROM ONE
SYSTEM TO ANOTHER --
LIKE LIGHT FROM A SUN
TO A PLANET!

THAT LIGHT TAKES EIGHT
MINUTES AT THE SPEED
OF, UH, Y'KNOW, LIGHT,
TO REACH EARTH ... BUT
NOT ALL OF IT MAKES
IT TO THE PLANET'S
SURFACE.

A LOT OF IT
BOUNCES OFF
THE UPPER
PART OF THE
ATMOSPHERE--



-- AND MORE GETS
ABSORBED ON THE WAY
DOWN BY A MOTLEY CREW
OF WATER VAPOR, CARBON
DIOXIDE, METHANE,
NITROUS OXIDE AND OZONE
-- WHAT WE LIKE TO CALL
"THE GREENHOUSE GANG!"

LIGHT ABSORBED BY
GREENHOUSE GASES
WARMS THE EARTH -- AND
THIS, AMONG MANY OTHER
FACTORS, IS WHAT MAKES
OUR PLANET IDEAL FOR
SUPPORTING LIFE!

PLANTS EVOLVED TO TRANSFORM SOME OF THE LIGHT THAT ESCAPES THE GREENHOUSE LAYER INTO SUGARS AND CARBOHYDRATES VIA PHOTOSYNTHESIS!

(THAT'S -- YES -- ANOTHER TRANSFER OF ENERGY BETWEEN SYSTEMS!)

ANIMALS EVOLVED TO CAPTURE THOSE STORED NUTRIENTS FOR THEMSELVES BY EATING SAID PLANTS!

(...AND ANOTHER TRANSFER...)

OTHER ANIMALS EVOLVED TO SNAG THOSE NUTRIENTS FOR THEMSELVES BY EATING THOSE ANIMALS!

ALL THIS ENERGY -- FROM THAT SINGLE BEAM OF SUNLIGHT!



BUT IT DOESN'T
END THERE!

THAT ENERGY INSIDE
PLANTS AND ANIMALS
DOESN'T JUST VANISH
WHEN THEY DIE.

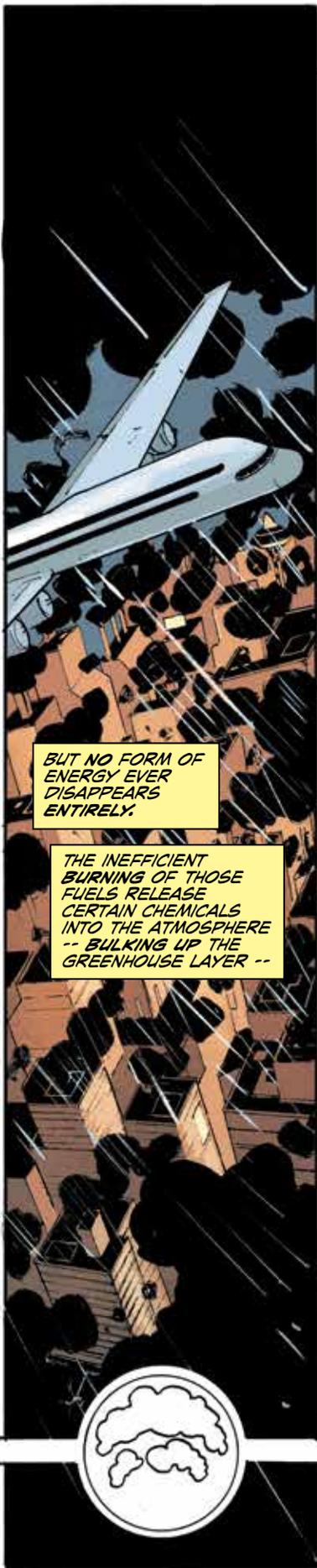
TRAPPED MILLIONS OF
YEARS IN THE GROUND,
THOSE BIOLOGICAL
MATERIALS TRANSFORM
INTO A RICH VARIETY OF
HYDROCARBONS.

HUMANS LEARNED HOW
TO HARNESS THESE
"FOSSIL FUELS" IN THE
19TH AND 20TH
CENTURIES...



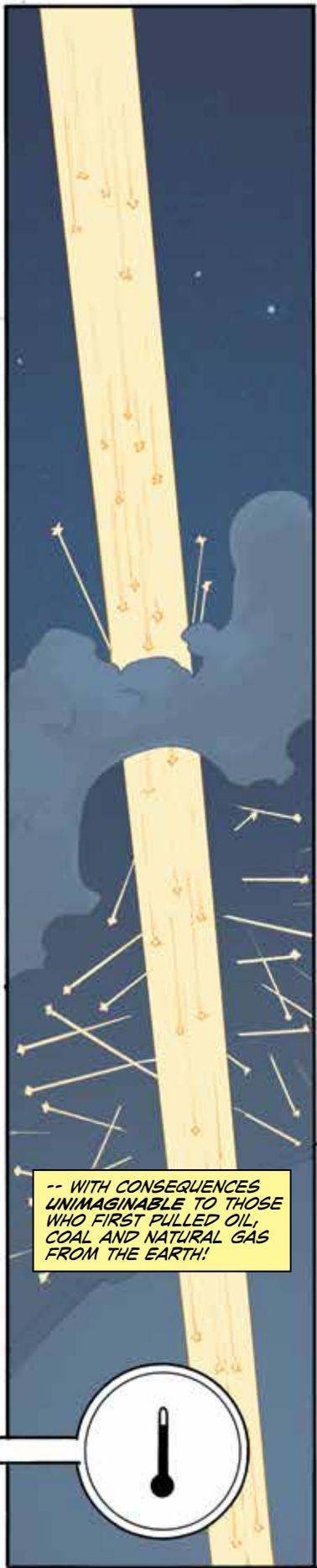


...AND IGNITED THE FIRE OF TECHNOLOGICAL ADVANCEMENT THAT BUILT THE MODERN WORLD AS WE KNOW IT TODAY!



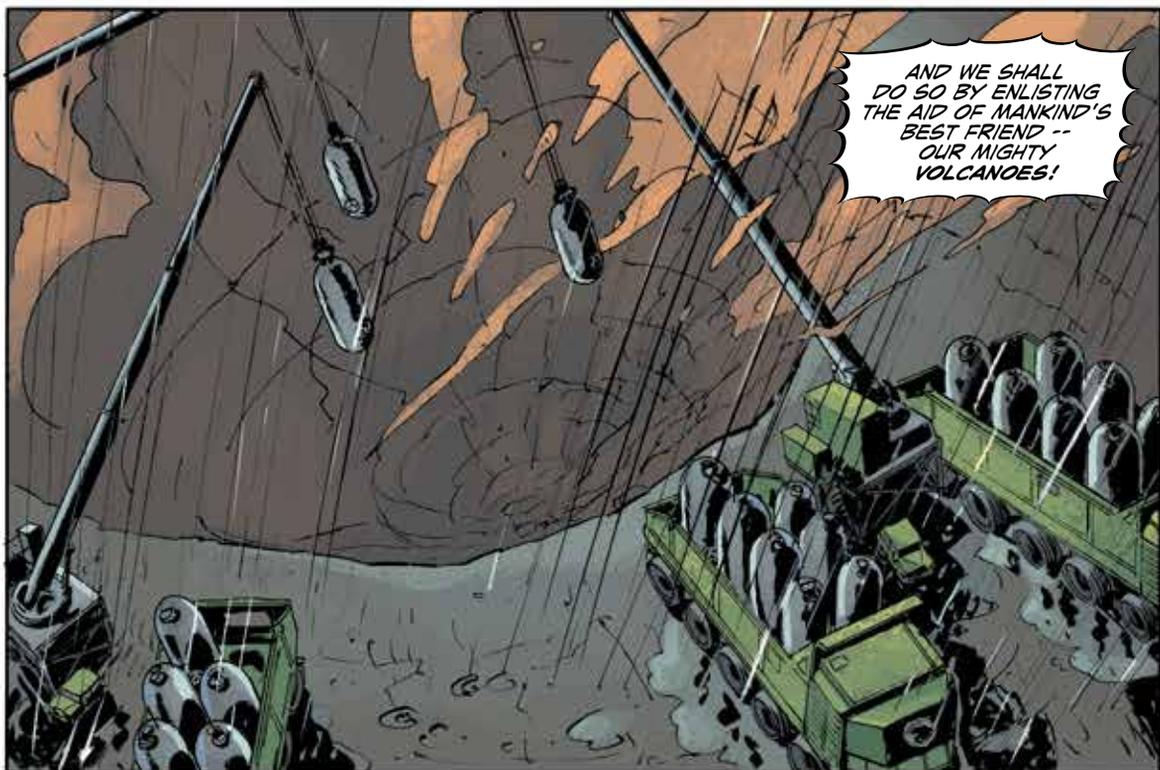
BUT NO FORM OF ENERGY EVER DISAPPEARS ENTIRELY.

THE INEFFICIENT BURNING OF THOSE FUELS RELEASE CERTAIN CHEMICALS INTO THE ATMOSPHERE -- BULKING UP THE GREENHOUSE LAYER --



-- WITH CONSEQUENCES UNIMAGINABLE TO THOSE WHO FIRST PULLED OIL, COAL AND NATURAL GAS FROM THE EARTH!





AND WE SHALL DO SO BY ENLISTING THE AID OF MANKIND'S BEST FRIEND -- OUR MIGHTY VOLCANOES!



AWRIGHT -- LET THEM NUKES DROP!



WE SHALL PURPOSEFULLY BLOW THEM UP SO THEY MAY COVER THE GLOBE IN A PROTECTIVE LAYER OF ASH AND DEFLECT EVEN MORE LIGHT FROM THE ATMOSPHERE!



IT'S LIKE THE EARTH IS GIVING HERSELF A HUG! AWWWW!

AND IT'S THE ONLY WAY (WE CAN THINK OF) TO SLOW DOWN GLOBAL WARMING, WITH ITS FREAKY WEATHER AND RISING SEA LEVELS --



-- WHICH OUR LAWYERS TELL US WE HUMANS HAD NOTHING TO DO WITH WHATSOEVER!

NOPE! UH-UH! WASN'T US! IT WAS LIKE THIS WHEN WE GOT HERE!



BUT, UH... YOU'RE PROBABLY GONNA WANNA COVER YOUR EARS!

IN, LIKE... T-MINUS 3 MINUTES!



HEY!

AWWW YEAH! ANOTHER CORPSE-MUNCHER BITES THE GRAVEDUST!

POK



TUCK?! WHAT'S THE BIG IDEA?

DIDN'T YOU HEAR THE MAN WITH THE BIG VOICE, CELINE? THE ZOMBIE APOCALYPSE IS COMING--

--AND I'VE GOT TO PRACTICE MY HEADSHOTS!

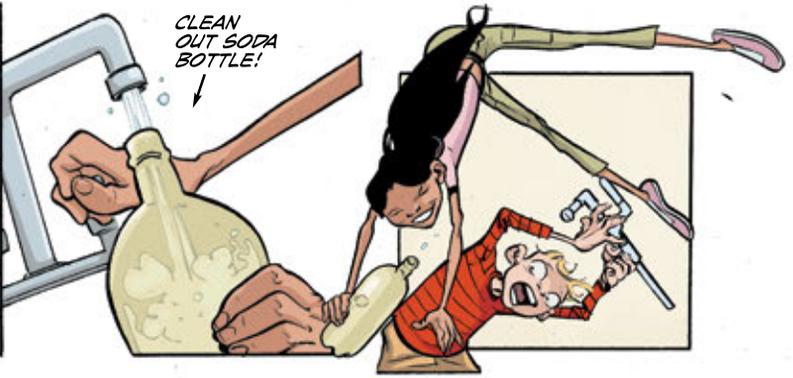


NOT THAT, BRAIN-ROT!

YOU SHOULD KNOW BETTER THAN TO FIRE THAT THING AT ANYBODY--



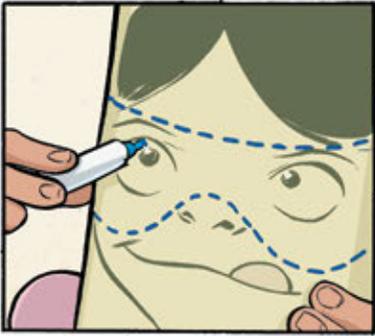
CLEAN OUT SODA BOTTLE!



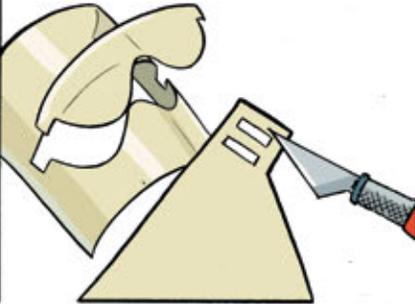
CRUSH BOTTLE!



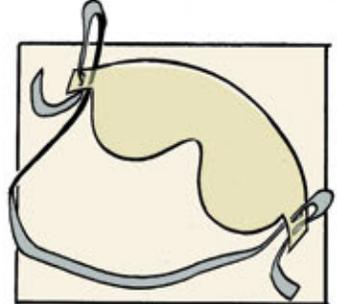
CUT BOTH ENDS OFF, THEN DOWN THE MIDDLE!



TRACE THE OUTLINE FOR THE MASK ON YOUR FACE!



CUT AGAIN! CAREFULLY MAKE TWO SLITS IN EACH CORNER WITH A HOBBY KNIFE!



THREAD THE STRAP (USE PART OF A BIKE INNER TUBE, OR THE RUBBER BANDS TOGETHER) THROUGH THE FOUR SLITS!

-- WITHOUT PROPER EYE PROTECTION!



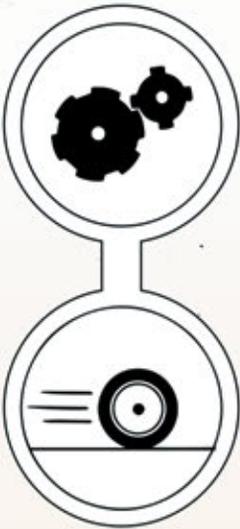
WARNING;

THESE GOGGLES ARE TOYS AND WILL PROTECT YOUR EYES ONLY AGAINST MARSHMALLOWS, NEVER SUBSTITUTE THEM FOR CERTIFIED SAFETY GLASSES WHEN RECOMMENDED.



ALWAYS USE FRESH MINI-MARSHMALLOWS -- WHEN THEY'RE SOFT, THEY CREATE A BETTER SEAL AGAINST AIR LEAKS.

SEAL YOUR LIPS AGAINST THE MOUTHPIECE SO YOU DON'T LEAK AIR!

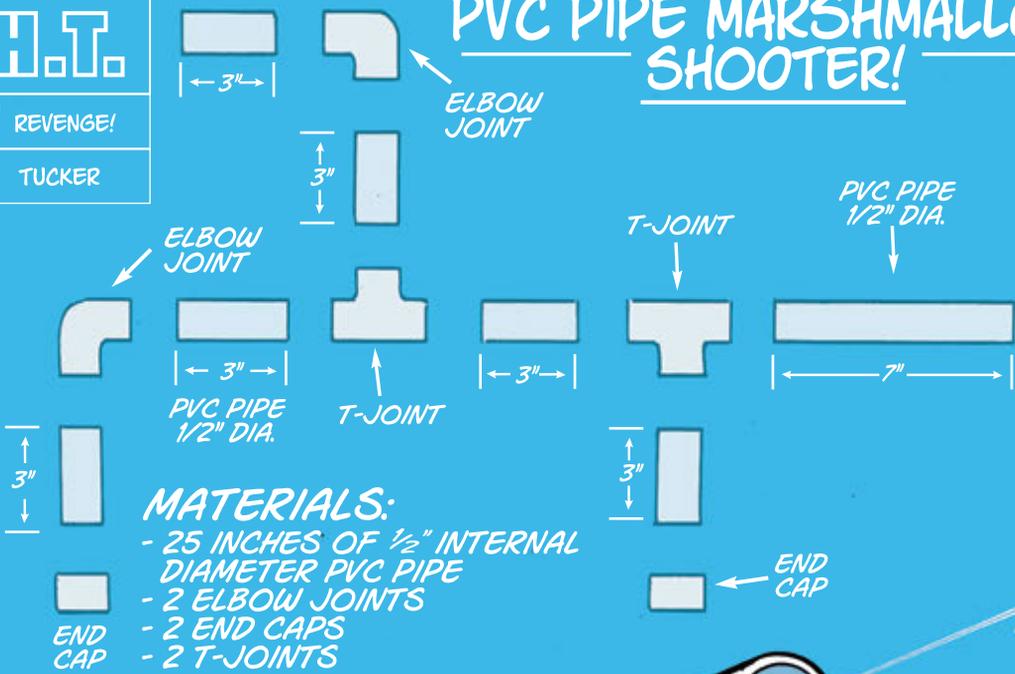


PVC PIPE MARSHMALLOW SHOOTER!



JOB: REVENGE!

ART: TUCKER



MATERIALS:

- 25 INCHES OF $\frac{1}{2}$ " INTERNAL DIAMETER PVC PIPE
- 2 ELBOW JOINTS
- 2 END CAPS
- 2 T-JOINTS

BLOW AS FAST AND AS HARD AS POSSIBLE TO WATCH THAT 'MALLOW GO!

FWOOMP!

Blowguns are traditional weapons in many indigenous tribes throughout the world. The principles are simple:

The energy input comes from the muscles in your respiratory system. Energy (or momentum in this case) is transferred from the air being pushed out of your lungs to the marshmallow being pushed through the pipe.

How far the marshmallow will go will depend upon how much momentum you can give to the marshmallow before it exits the pipe. If there are leaks around the edge of the marshmallow, then your precious breath will be wasted as it leaks past the projectile.

With their fine coating of powdered sugar, marshmallows have low friction, so energy isn't lost sliding against the tube!

If the pipe is too short you won't have enough time to impart momentum. If the pipe is too long, you won't have enough air in your lungs to continue to accelerate the marshmallow.

Experiment with the 'optimum' length of pipe for your lungs and style!



MOAH WIKE
DIII OMBUH
HUULL OHH HOOB
AIIHHH

WHAT?!



"MORE LIKE
THIS ZOMBIE IS
FULL OF HOT
AIR!" HAH!

POINK

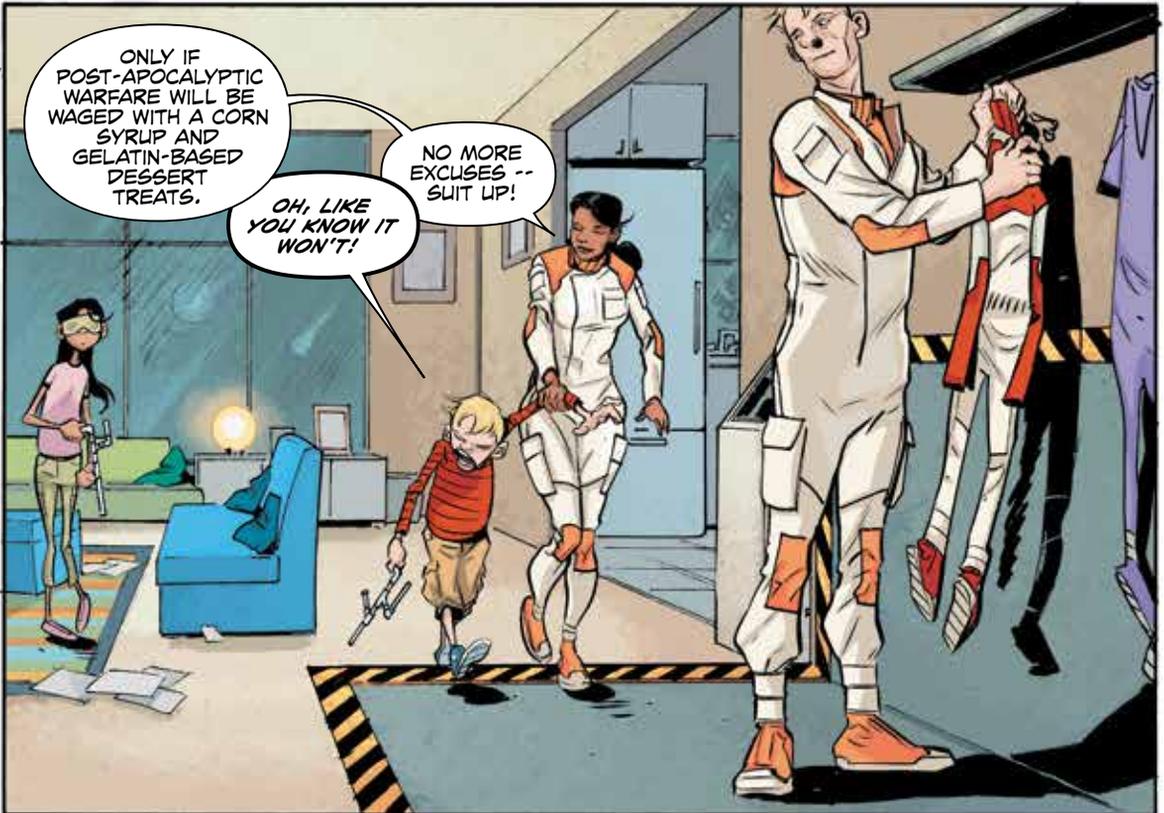
POINK



OKAY, TUCK,
CELINE --
PLAYTIME'S
OVER ... MAYBE
FOREVER.

LET'S GO,
WE'RE OUT OF
TIME --

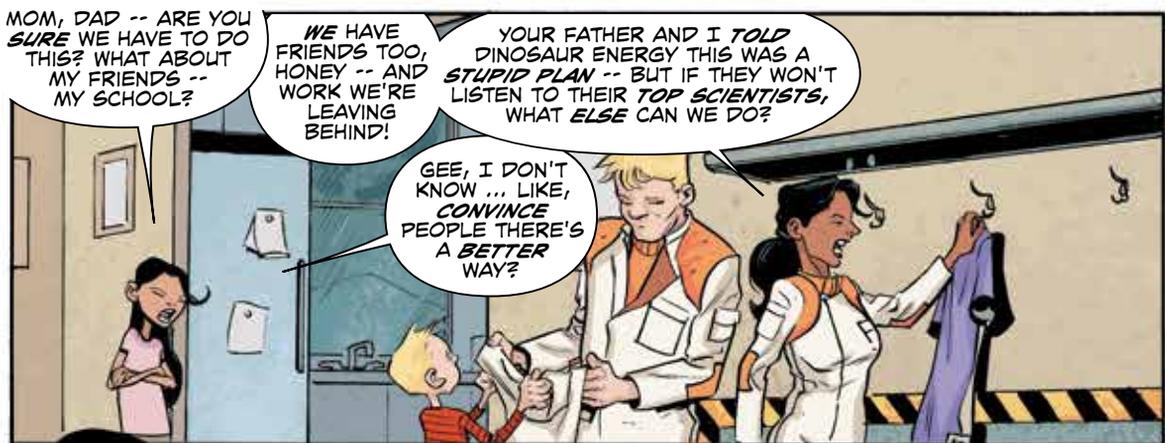
AW, C'MON,
MA -- THIS IS
IMPORTANT
"DOOMSDAY
TRAINING!"



ONLY IF
POST-APOCALYPTIC
WARFARE WILL BE
WAGED WITH A CORN
SYRUP AND
GELATIN-BASED
DESSERT
TREATS.

OH, LIKE
YOU KNOW IT
WON'T!

NO MORE
EXCUSES --
SUIT UP!



MOM, DAD -- ARE YOU SURE WE HAVE TO DO THIS? WHAT ABOUT MY FRIENDS -- MY SCHOOL?

WE HAVE FRIENDS TOO, HONEY -- AND WORK WE'RE LEAVING BEHIND!

YOUR FATHER AND I TOLD DINOSAUR ENERGY THIS WAS A STUPID PLAN -- BUT IF THEY WON'T LISTEN TO THEIR TOP SCIENTISTS, WHAT ELSE CAN WE DO?

GEE, I DON'T KNOW ... LIKE, CONVINCE PEOPLE THERE'S A BETTER WAY?



MAYBE YOU'RE RIGHT. ACTUALLY, I'M SURE YOU'RE RIGHT.

BUT YOU'LL LEARN, CELINE. BEING RIGHT DOESN'T MATTER WHEN YOU'RE OUT OF TIME.

JUST -- PROMISE ME SOMETHING, CELINE.

YOU'RE SMART -- MAYBE TOO SMART FOR YOUR OWN GOOD, SOMETIMES.



JUST -- IF ANYTHING HAPPENS -- TO YOUR FATHER OR ME, IN THE MIDDLE OF THIS CRAZINESS--



WHAT ... WHAT'S GOING TO HAPPEN TO YOU?

NOTHING, I HOPE.

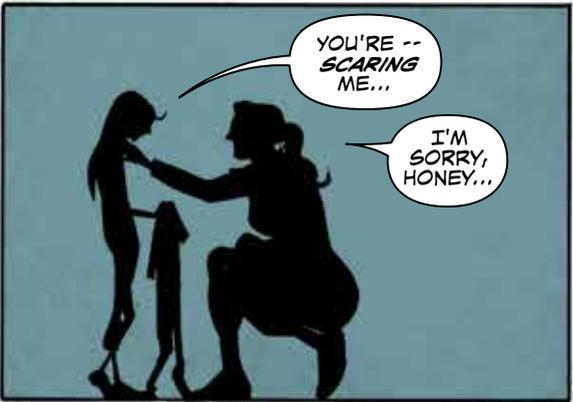
BUT -- WATCH AFTER YOUR BROTHER. HE DOESN'T HAVE THE SELF-CONTROL YOU DO.

BUT MOOOOOM -- HE'S NOT MY REAL --



PROMISE.

OKAY, OKAY, GEEZ, I PROMISE.



YOU'RE -- SCARING ME...

I'M SORRY, HONEY...



T-MINUS 30 SECONDS ...
GET YOUR CELL PHONES
AND CAMERAS READY!
YOU'RE NOT GONNA
WANNA MISS THIS!



OKAY,
N.A.N.N.I.....

...MAYBE
I SHOULD
HAVE SCARED
YOU MORE,
SOONER...



TEN
SECONDS
BEFORE THE
BIG SHOW!

ALL PAID FOR
BY A MINOR
SURCHARGE ON YOUR
ENERGY BILL, ALL
THANKS TO YOUR
GOOD BUDDIES AT
DINO-E!



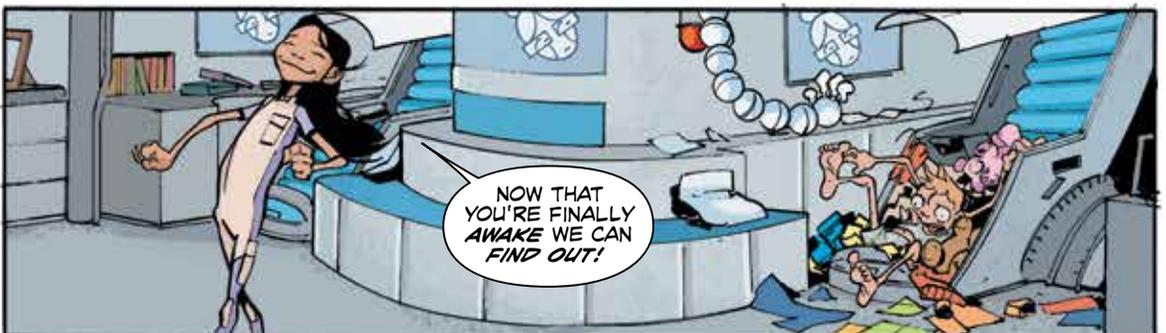
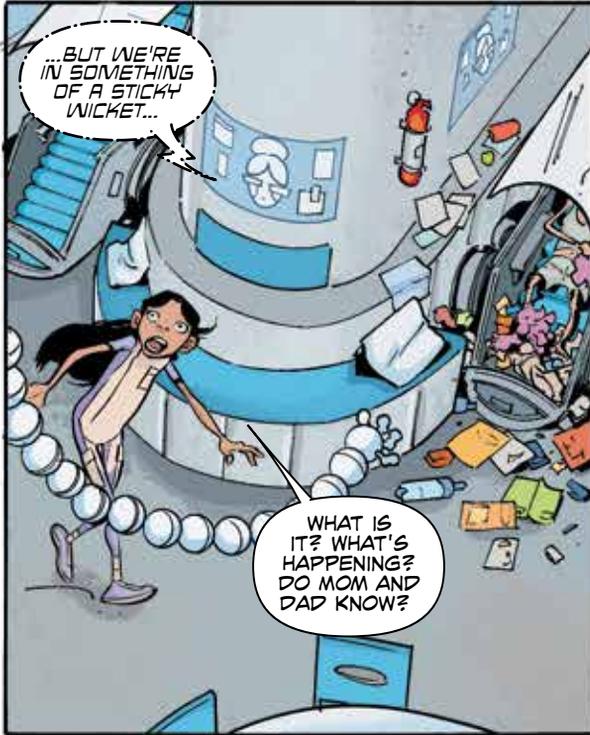
...TAKE US
DOWN.

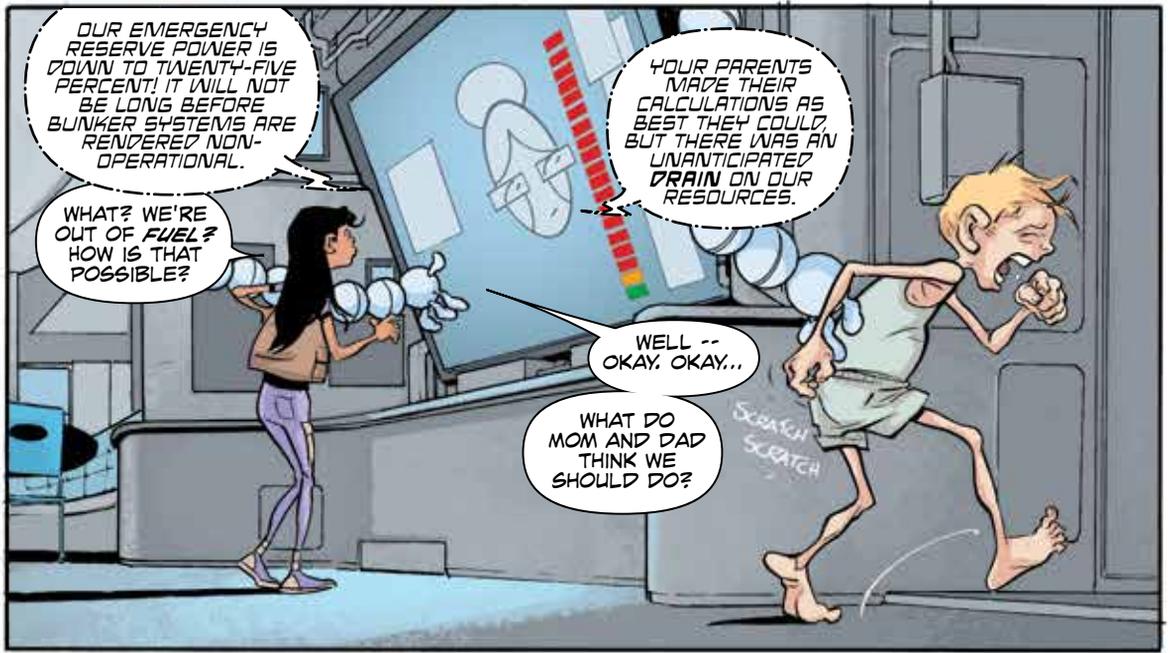


BROOOOT
BROOOOT
BROOOOT
BROOOOT

BROOOOT
BROOOOT
BROOOOT
BROOOOT







OUR EMERGENCY RESERVE POWER IS DOWN TO TWENTY-FIVE PERCENT! IT WILL NOT BE LONG BEFORE BUNKER SYSTEMS ARE RENDERED NON-OPERATIONAL.

YOUR PARENTS MADE THEIR CALCULATIONS AS BEST THEY COULD BUT THERE WAS AN UNANTICIPATED DRAIN ON OUR RESOURCES.

WHAT? WE'RE OUT OF FUEL? HOW IS THAT POSSIBLE?

WELL -- OKAY. OKAY...

WHAT DO MOM AND DAD THINK WE SHOULD DO?

SCRATCH SCRATCH



THAT'S ... THAT'S JUST IT.

I AWAKE YOUR PARENTS AND INFORMED THEM OF OUR SITUATION A WEEK AGO.

THEY TOOK THE BUNKER'S ROVER AND VENTURED OUT IN SEARCH OF MORE FUEL...

...AND NEVER RETURNED.

THEY'RE ... THEY'RE GONE? HOW MUCH LONGER CAN WE STAY DOWN HERE?!



IF I DIVERTED ALL THE POWER TO THE LIFE SUPPORT SYSTEMS. WE SHOULD HAVE ENOUGH TO KEEP YOU IN CLEAN AIR FOR FIVE DAYS...

THREE DAYS...

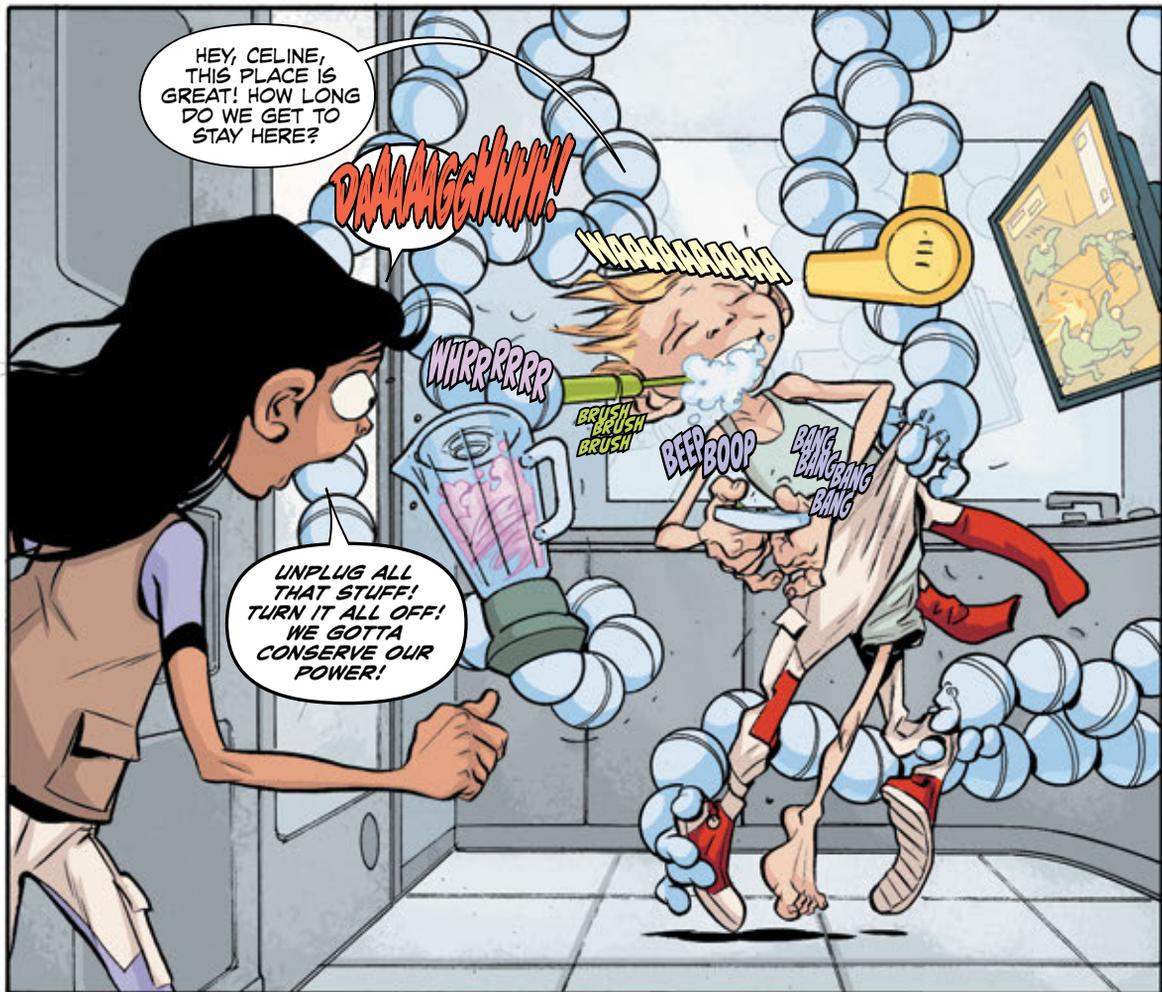


TWELVE HOURS...



SIX HOURS...

WAIT! STOP! WHAT'S DRAINING ALL OUR POWER?!



HEY, CELINE, THIS PLACE IS GREAT! HOW LONG DO WE GET TO STAY HERE?

DAAAAAGGHHHH!

WHIRRRRRRRRR

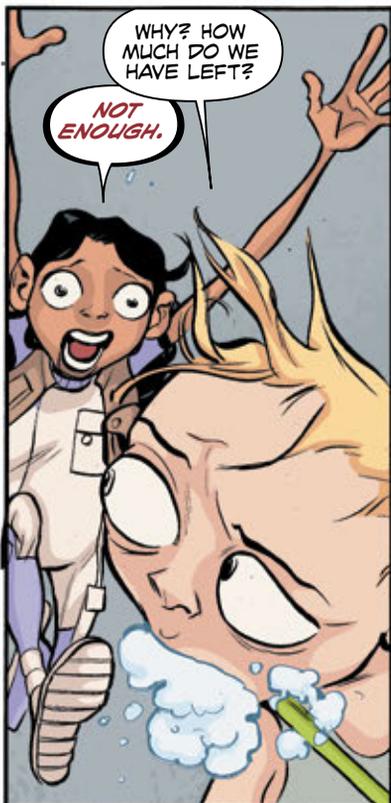
WHIRRRRRR

BRUSH BRUSH BRUSH

BEEP BOOP

BANG BANG BANG BANG

UNPLUG ALL THAT STUFF! TURN IT ALL OFF! WE GOTTA CONSERVE OUR POWER!

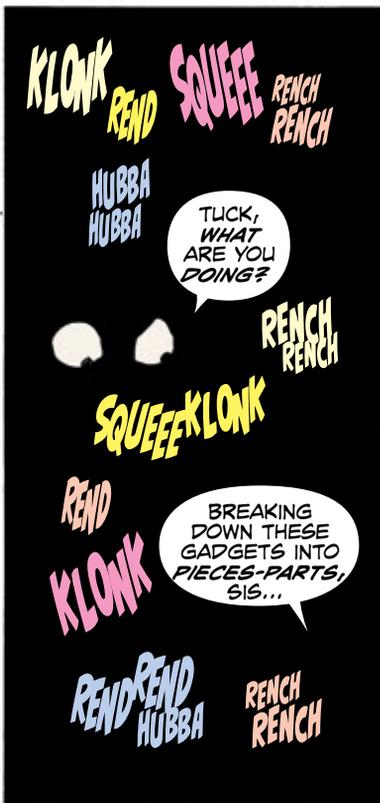


WHY? HOW MUCH DO WE HAVE LEFT?

NOT ENOUGH.



OOOOOH BOY.



KLONK REND SQUEEE RENCH RENCH

HUBBA HUBBA

TUCK, WHAT ARE YOU DOING?

RENCH RENCH

SQUEEE KLONK

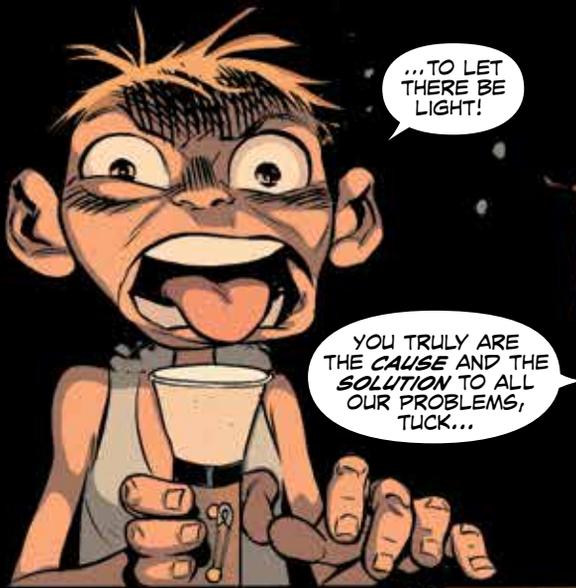
REND

KLONK

BREAKING DOWN THESE GADGETS INTO PIECES-PARTS, SIS...

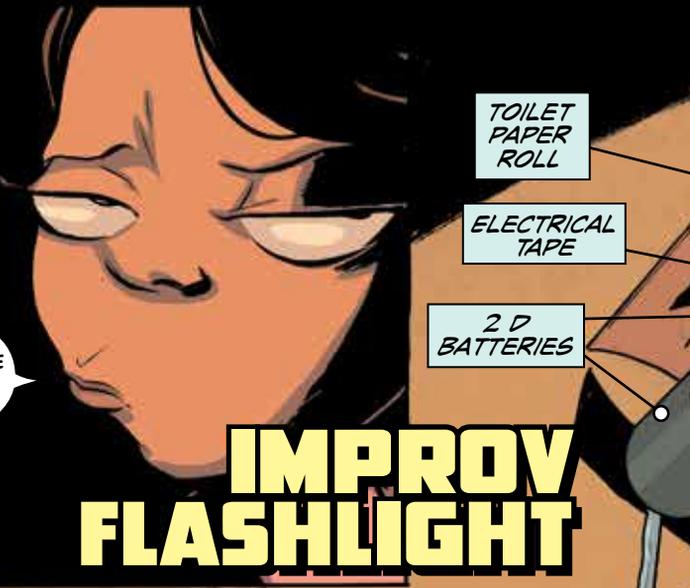
REND REND HUBBA

RENCH RENCH



...TO LET THERE BE LIGHT!

YOU TRULY ARE THE CAUSE AND THE SOLUTION TO ALL OUR PROBLEMS, TUCK...



TOILET PAPER ROLL

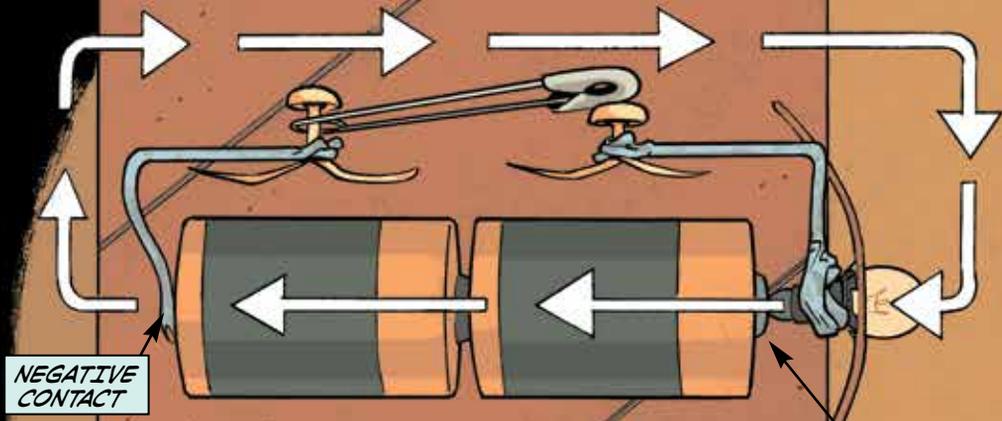
ELECTRICAL TAPE

2 D BATTERIES

IMPROV FLASHLIGHT

1 TO MAKE THE FLASHLIGHT, CUT A TOILET PAPER ROLL DOWN THE MIDDLE. THREAD ONE FASTENER THROUGH THE HOLE AT THE END OF THE SAFETY PIN. NOW POKE BOTH FASTENERS THROUGH THE CARDBOARD SO THEY ARE ALIGNED AT A SAFETY PINS LENGTH APART. THIS WILL ACT AS THE ON AND OFF SWITCH FOR THE FLASHLIGHT.

2 TO COMPLETE THE CIRCUIT OF ELECTRICITY WE'LL NEED TWO WIRES. USING A 4 BY 6 INCH SHEET OF ALUMINUM FOIL, FOLD IT OVER 5 TIMES CREATING A 1/4 INCH WIRE THAT IS 6 INCHES LONG. REPEAT FOR THE SECOND WIRE. WRAP ONE END OF EACH WIRE AROUND THE FASTENERS. SECURE THE FASTENERS AND ALUMINUM WIRE TO THE CARDBOARD USING ELECTRICAL TAPE. THE FRONT FASTENED WIRE WILL CONNECT TO THE LIGHT BULB(SEE STEP 4). THE BACK FASTENED WIRE WILL CONNECT TO THE NEGATIVE SIDE OF THE BATTERIES(SEE STEP 5).



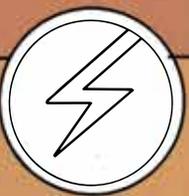
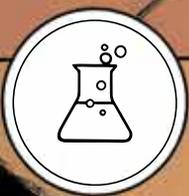
NEGATIVE CONTACT

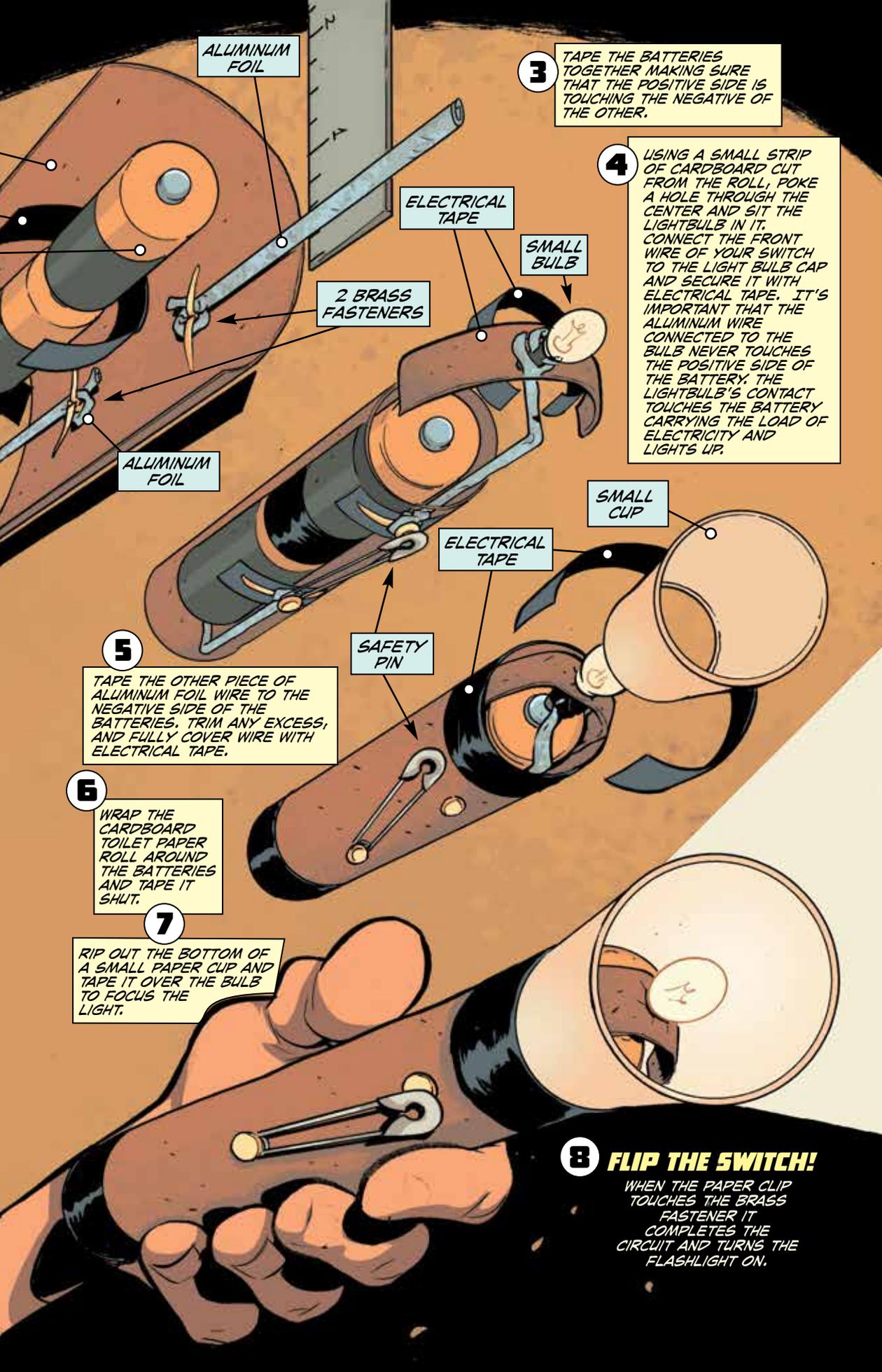
POSITIVE CONTACT

A CLOSED CIRCUIT IS CREATED WHEN THE SAFETY PIN (YOUR SWITCH) CONNECTS BOTH FASTENERS. THIS ALLOWS THE ELECTRICITY TO IN ONE DIRECTION (DIRECT CURRENT) IN A LOOP FROM THE BATTERY (YOUR STORED UP ENERGY) TO THE LIGHT BULB USING THE ALUMINUM FOIL AS A CONDUCTIVE MATERIAL. THE BULB IS THE LOAD, WHICH CONSUMES THE POWER BY THE CIRCUIT HEATING UP THE FILAMENT IN THE BULB CREATING LIGHT.

WARNING;

DO NOT SHORT CIRCUIT THE FLASHLIGHT BY BYPASSING THE BULB WITH THE ALUMINUM WIRES. THE WIRE SHOULD ONLY CONNECT TO THE BULB; NEVER DIRECTLY TO THE POSITIVE SIDE OF THE BATTERY. DOING SO WILL CAUSE A MALFUNCTION, RESULTING IN AN EXCESSIVE ELECTRIC CURRENT THAT CAN CAUSE OVERHEATING, FIRE, OR EXPLOSION.





ALUMINUM FOIL

3 TAPE THE BATTERIES TOGETHER MAKING SURE THAT THE POSITIVE SIDE IS TOUCHING THE NEGATIVE OF THE OTHER.

ELECTRICAL TAPE

SMALL BULB

2 BRASS FASTENERS

4 USING A SMALL STRIP OF CARDBOARD CUT FROM THE ROLL, POKE A HOLE THROUGH THE CENTER AND SIT THE LIGHTBULB IN IT. CONNECT THE FRONT WIRE OF YOUR SWITCH TO THE LIGHT BULB CAP AND SECURE IT WITH ELECTRICAL TAPE. IT'S IMPORTANT THAT THE ALUMINUM WIRE CONNECTED TO THE BULB NEVER TOUCHES THE POSITIVE SIDE OF THE BATTERY. THE LIGHTBULB'S CONTACT TOUCHES THE BATTERY CARRYING THE LOAD OF ELECTRICITY AND LIGHTS UP.

ALUMINUM FOIL

SMALL CUP

ELECTRICAL TAPE

5

TAPE THE OTHER PIECE OF ALUMINUM FOIL WIRE TO THE NEGATIVE SIDE OF THE BATTERIES. TRIM ANY EXCESS, AND FULLY COVER WIRE WITH ELECTRICAL TAPE.

SAFETY PIN

6

WRAP THE CARDBOARD TOILET PAPER ROLL AROUND THE BATTERIES AND TAPE IT SHUT.

7

RIP OUT THE BOTTOM OF A SMALL PAPER CUP AND TAPE IT OVER THE BULB TO FOCUS THE LIGHT.

8

FLIP THE SWITCH!

WHEN THE PAPER CLIP TOUCHES THE BRASS FASTENER IT COMPLETES THE CIRCUIT AND TURNS THE FLASHLIGHT ON.



C'MON
≡GASP≡
WITHOUT
POWER THE
PUMPS
WON'T BE
ABLE TO
GET US
≡WHEEZE≡
AIR TO
BREATHE
FROM
OUTSIDE!



BUT ≡KOF≡
WHAT ABOUT
MOM AND DAD?
WE JUST CAN'T
≡GAK≡
LEAVE THEM
BEHIND!



THAT'S
JUST IT!
THEY'VE
ALREADY
≡KOFF≡
GONE!

WHADAYOU
MEAN
≡CHOK≡
GONE?



I'LL
EXPLAIN
≡SHUFF≡
WHEN WE'RE
OUTSIDE!



NEXT: INTO THE UNKNOWN