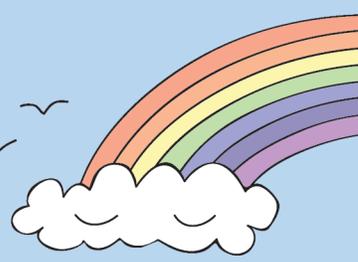
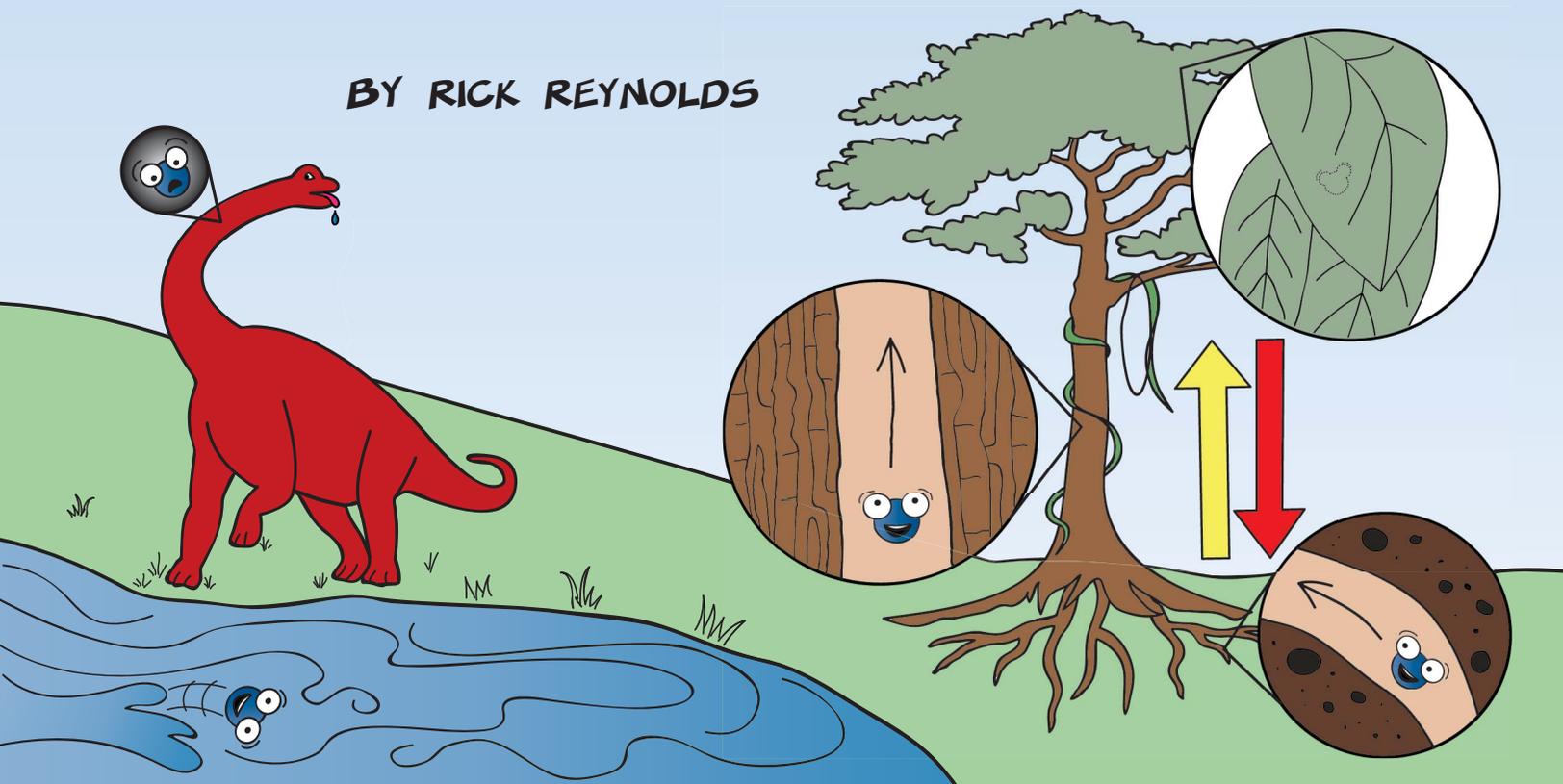


MARCO THE MOLECULE

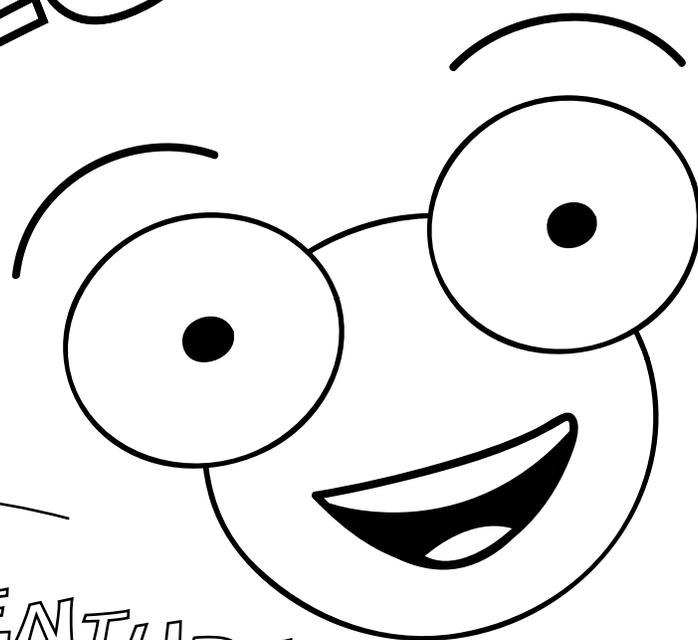
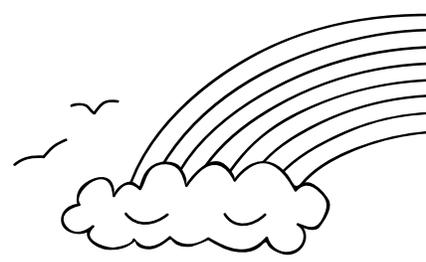


WATER ADVENTURE AND ACTIVITY BOOK

BY RICK REYNOLDS



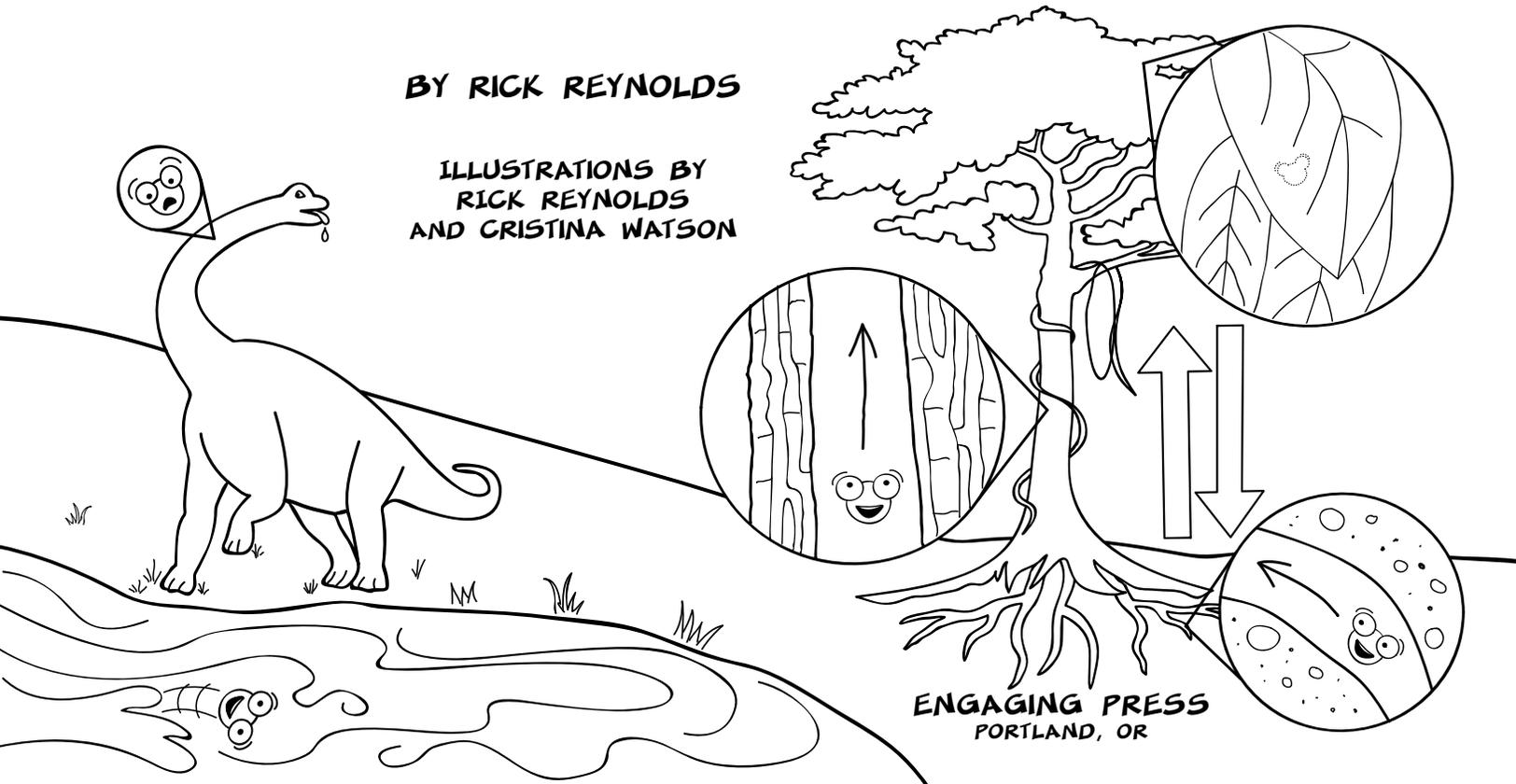
MARCO THE MOLECULE



WATER ADVENTURE AND ACTIVITY BOOK

BY RICK REYNOLDS

ILLUSTRATIONS BY
RICK REYNOLDS
AND CRISTINA WATSON



ENGAGING PRESS
PORTLAND, OR

Written by Rick Reynolds, M.S.Ed.

Illustrated by Rick Reynolds and Cristina Watson

Edited by Krista Reynolds, MLIS and Diane Schauer, MLS

Book and cover designed and produced by Rick Reynolds



Published by Engaging Press

An imprint of Engaging Every Student, LLC

Portland, Oregon, U.S.A.

www.engagingpress.com

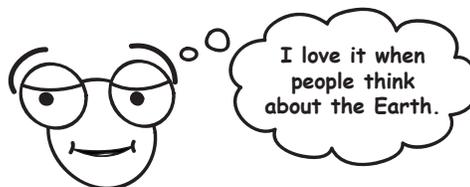
Volume discounts available for schools,
professional organizations, and fundraisers

Copyright © 2012 by Rick Reynolds

The purchase of this book entitles teachers and parents to reproduce individual activities for a single classroom or household use only. Otherwise, no parts of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language, in any form, by any means without the written permission of the publisher. Brief quotations embodied in critical articles or reviews are permissible.

Marco the Molecule™, Engaging Press™, and Engaging Every Student™ are trademarks of Engaging Every Student, LLC. EverGreen Twins® is a registered trademark of Engaging Every Student, LLC.

ISBN-13: 978-0-9830016-1-4

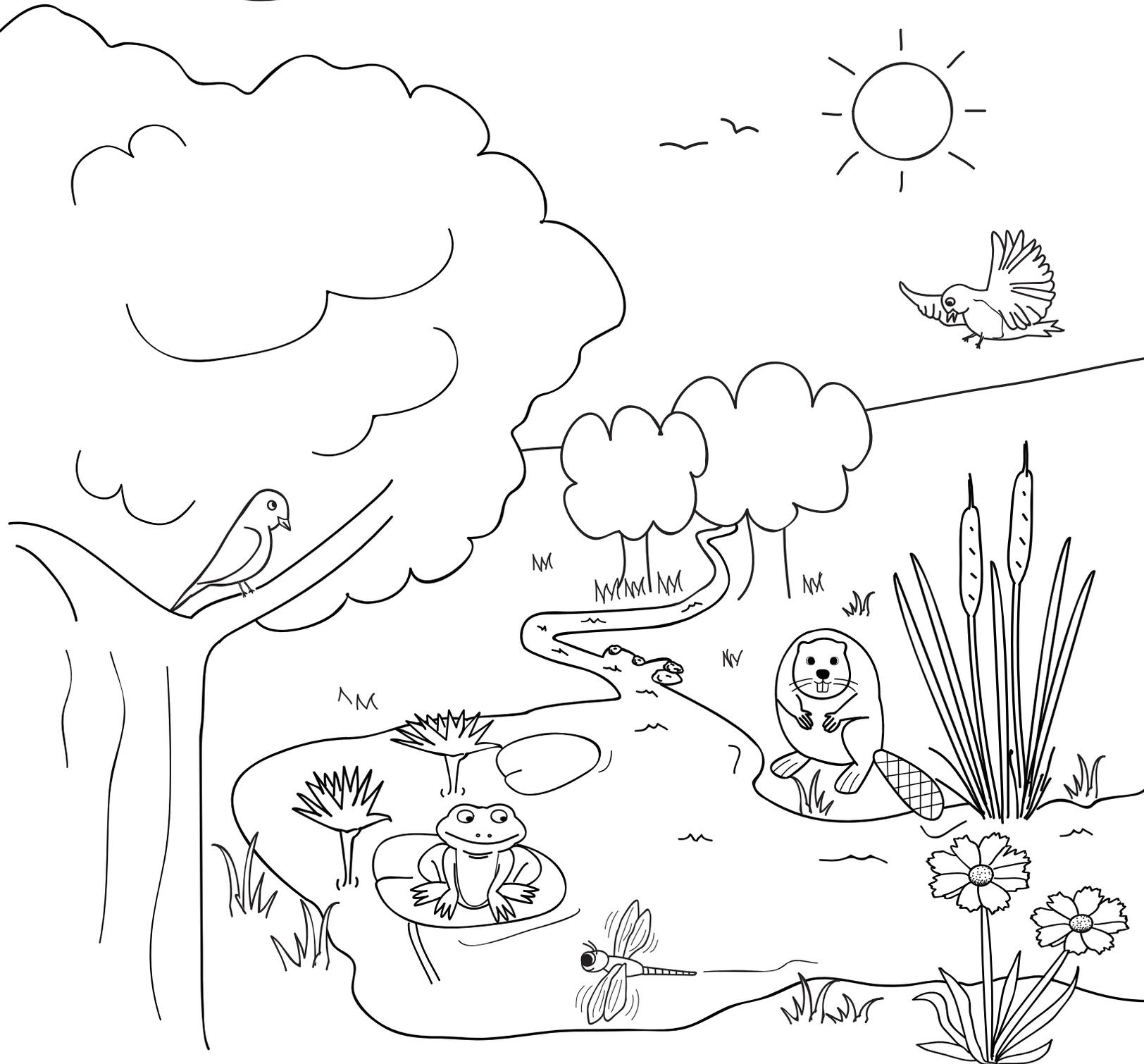


Proudly printed in Portland, Oregon, U.S.A. on FSC-certified,
100% post-consumer waste recycled paper.

Bound with 100% recycled plastic Eco-Coil produced in Oregon.



**FOR KRISTA AND ALL WHO LOVE MARCO
AND HIS WATER MOLECULE FRIENDS**



THANK YOU...

...to everyone who has provided support and feedback on Marco the Molecule and the EverGreen Twins, including:

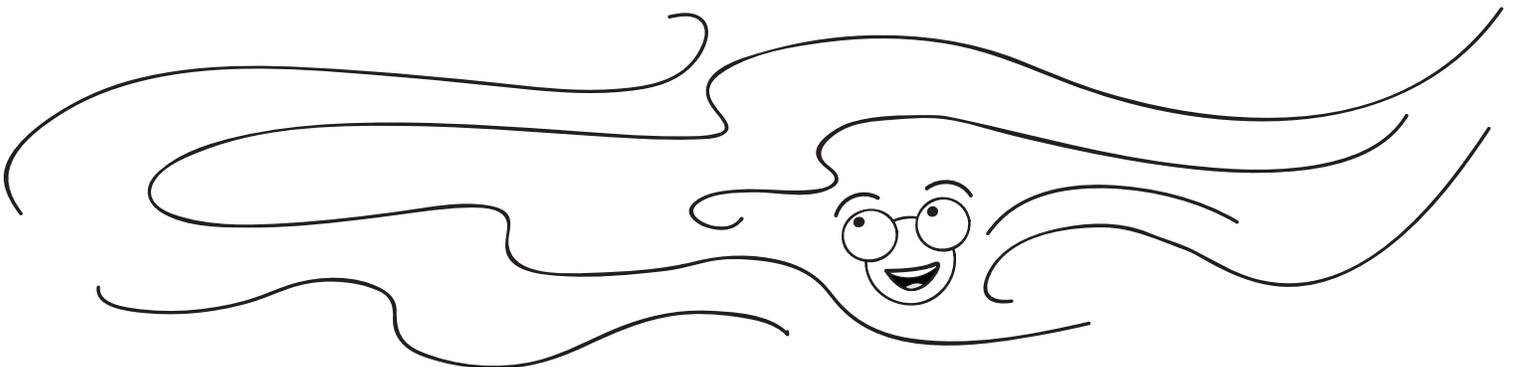
Robin Arehart, M.A.T., Meg Courtnage, M.A.T., Julie Craddock, Cath Cuff, M.Ed., Suzanne Deakins, Ph.D., H.W.M., Heidi and Tim Donovan, Michael Fulop, Psy.D., Chris Gates, Debbie Gorenstein, M.A., Charlie Graham, Brett Hamilton, Christopher Hanrahan, M.D., Ph.D., Megan Hanrahan, Amy Hansen, M.S., Ross Harris, Jo-el Hibbian, Lisa Huyck, Ph.D., Jessica Levine, M.Ed., Lisa Lucas, David H. Madden, Esq., Tammy Marquez-Goldham, Jonathan and Lori Nussbaum, Lynette Nussbaum, Jean Omelchuck, Renae Prell-Mitchell, Ph.D., Tracy Price, Marin Richeson, Shawn Schneider, Shane Sasnow, M.A., Karen Sjoblom, Amanda Trujillo, Anne and Banks Upshaw, Lori Van Deman-Iseri, Michael Wahl, M.Ed., Tamara Wallace, Cristina Watson, Rick Wood, M.S., and John Yanosy, M.S..

...and to the many young people who provided helpful input and inspiration, especially: my nephews Adam and Ty Cetorelli, my nephew and niece Cedric and Maiti Donovan (who thought of Marco's name), Nathaniel Eddleman-Hanley, Ashlyn Funk-Tracy, Ian and Andrew Hanrahan, Shantih Kleen, Maggie Salter, Olivia Scott, Eliza Soske, Mika Stanard, Hudson and Cassidy Schneider, and Liam and Siana Yanosy.

Most of all, I want to thank my loving wife and trusted advisor Krista, my parents Richard and Donna Reynolds, my sisters Bonnie Reynolds, Deborah Reynolds, M.A., and Donna Cetorelli, my mother and father-in-law Brent and Diane Schauer, and the rest of my fabulous family and friends. Their love, encouragement, and helpful insights sustained me through the challenging process of creating this book.

I hope you, the reader, will enjoy *Marco the Molecule* and be inspired to think more about him and his precious water molecule friends.

In gratitude and hope for a future with enough pure, clean water for all,
Rick



CONTENTS

INTRODUCTION 6

MARCO THE MOLECULE'S WATER ADVENTURES ... 9

PART 1: SOLAR-POWERED EVAPORATION 9

PART 2: COOL CONDENSATION 15

PART 3: PRECIOUS PRECIPITATION 18

PART 4: TRANSPORTATION & TRANSPIRATION .. 22

PART 5: CHANGING PHASES - AGAIN! 24

PART 6: THE RUNOFF RUN - WITH HURDLES ... 27

PART 7: FLASH FORWARD TO TODAY 32



MARCO'S ACTIVITIES 34

MARCO'S MAGICAL WATER CYCLE 34

MARCO'S CROSSWORD PUZZLE 35

OCEAN MAZE 36

MARCO'S WATER CYCLE WORD SEARCH 37

LIVING OR NONLIVING? 38

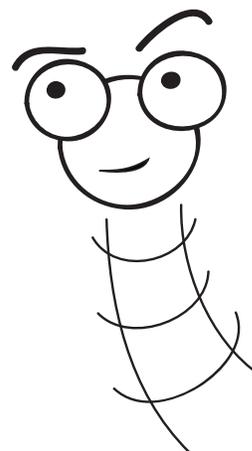
H₂O-KU 39

MARCO'S SCAVENGER HUNT! 41

MARCO'S NEXT ADVENTURE 43

MARCO THE MIXED-UP MOLECULE 47

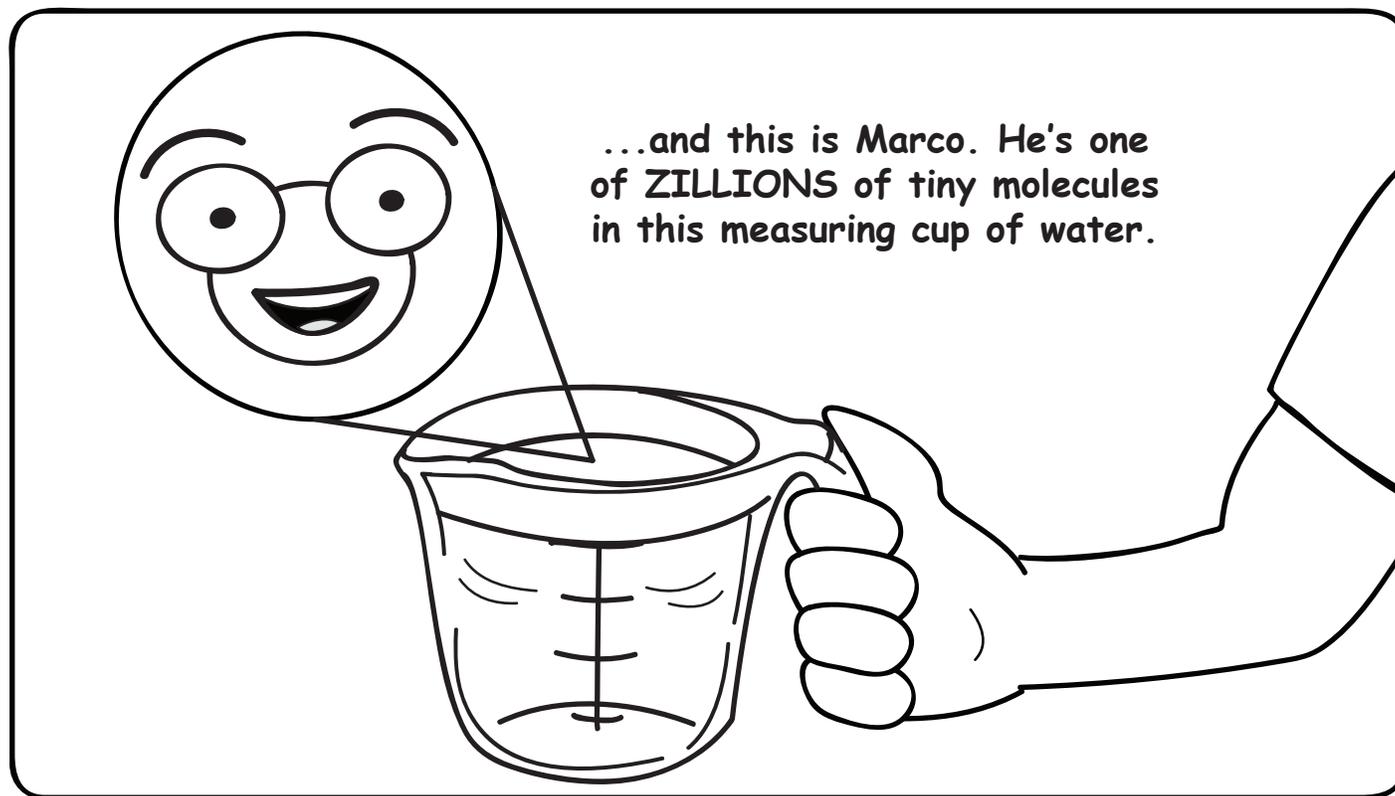
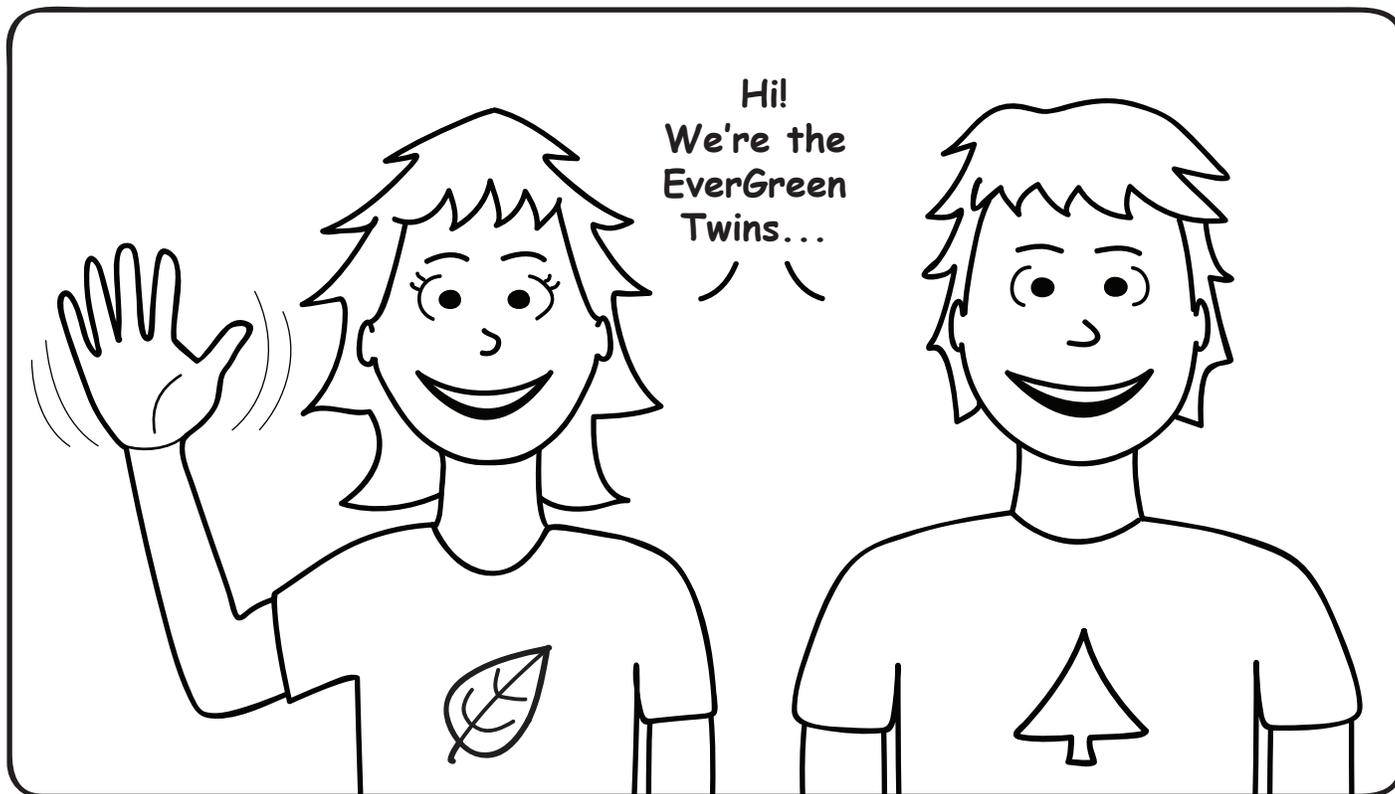
MARCO'S ANSWER KEYS 49



GLOSSARY /

SOLUTION TO MARCO THE MIXED-UP MOLECULE 56

INTRODUCTION



Water molecules are **INCREDIBLY** small **AND** incredibly important.

ALL living things, like plants and animals, need them to survive.



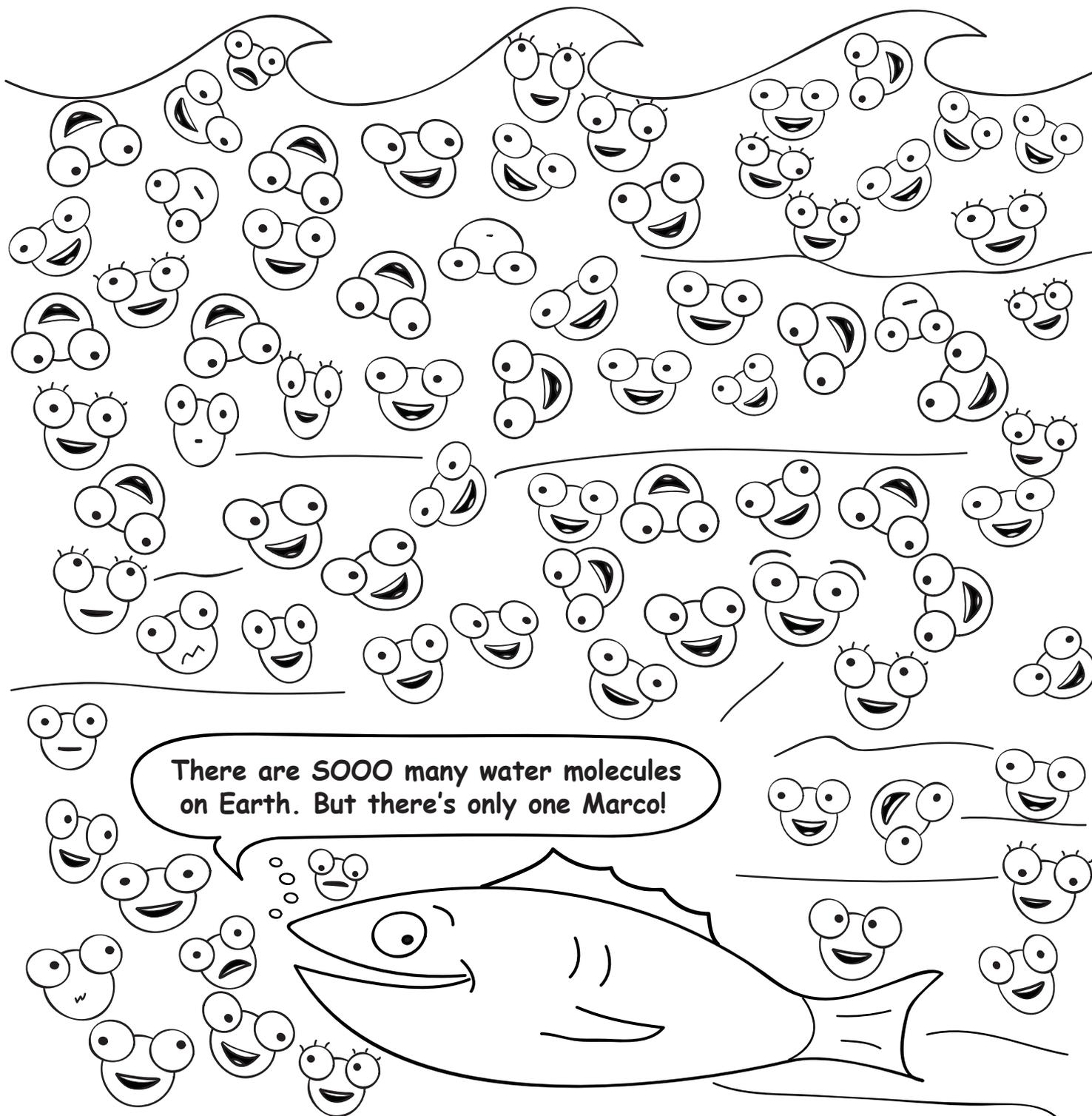
We hope you enjoy Marco's adventures and that you'll color them to bring them to life.

Be like Marco and help plants grow, animals thrive, and Earth become a more beautiful place.



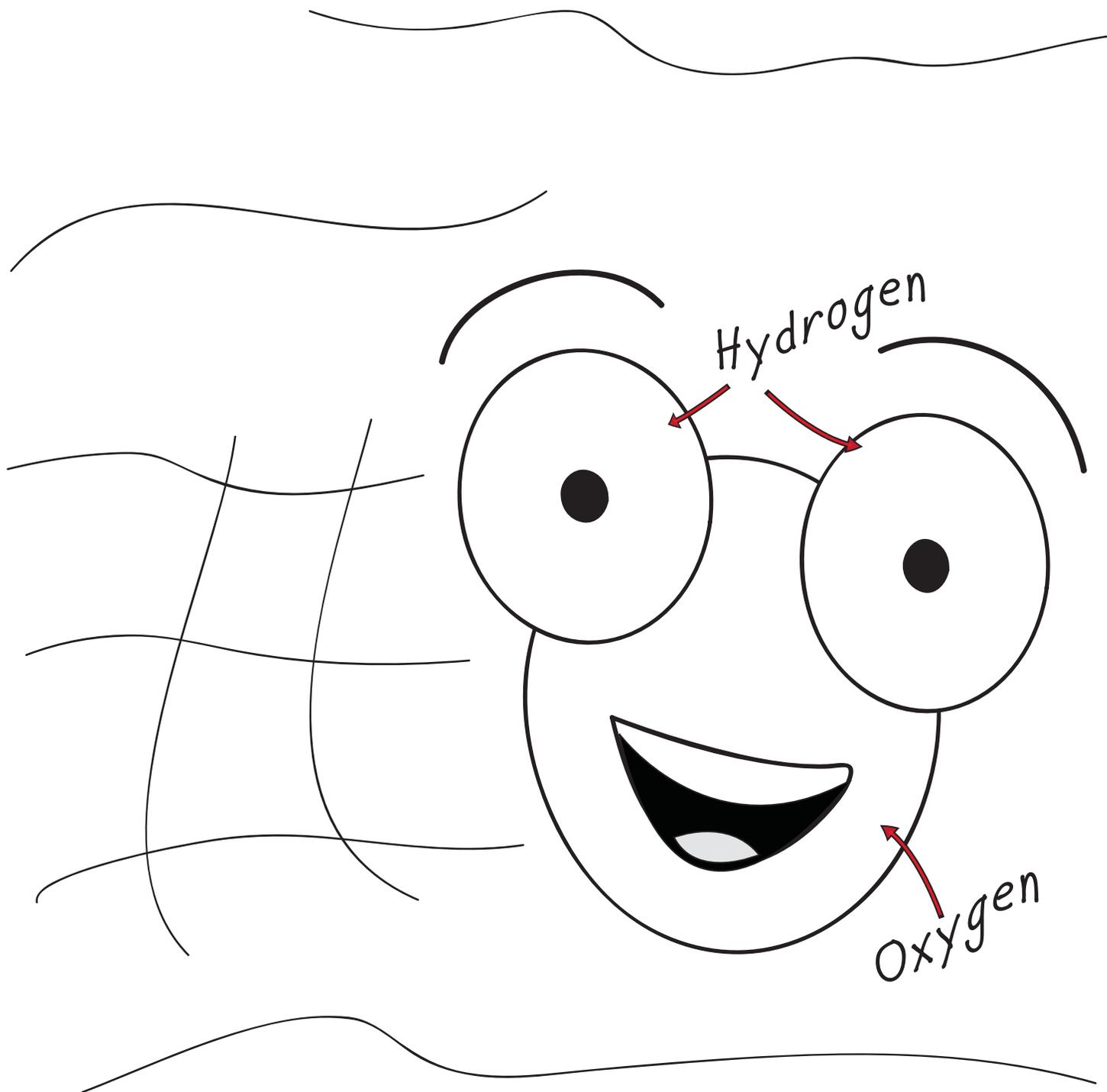
PART 1: SOLAR-POWERED EVAPORATION

Eons ago, a water molecule named Marco was having fun sloshing around with his friends. He was a very ordinary water molecule, like all of the zillions of others who lived in his vast ocean.



(Marco and friends shown BILLIONS of times larger than actual size.)

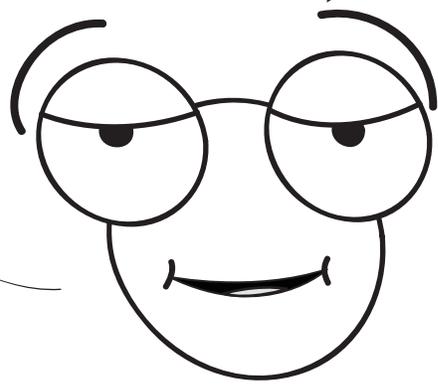
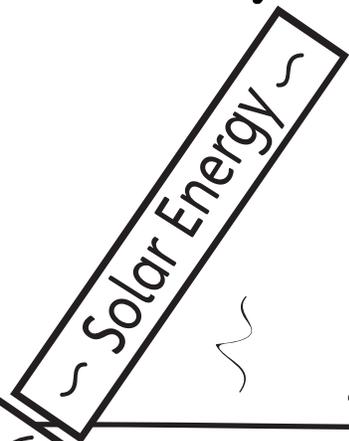
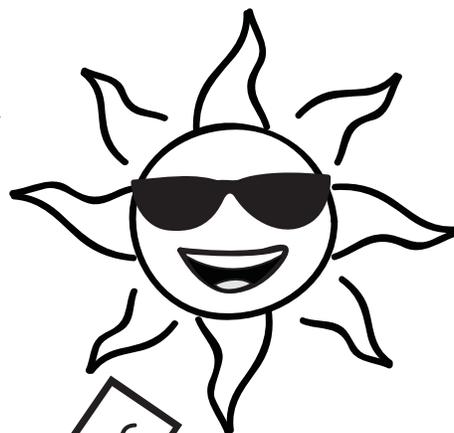
Made of two **atoms** of the element **hydrogen** and one atom of the element **oxygen**, Marco liked being a **liquid**. He got to travel wherever the **currents** took him—which was all over the planet!



Marco loves cruising the ocean currents.

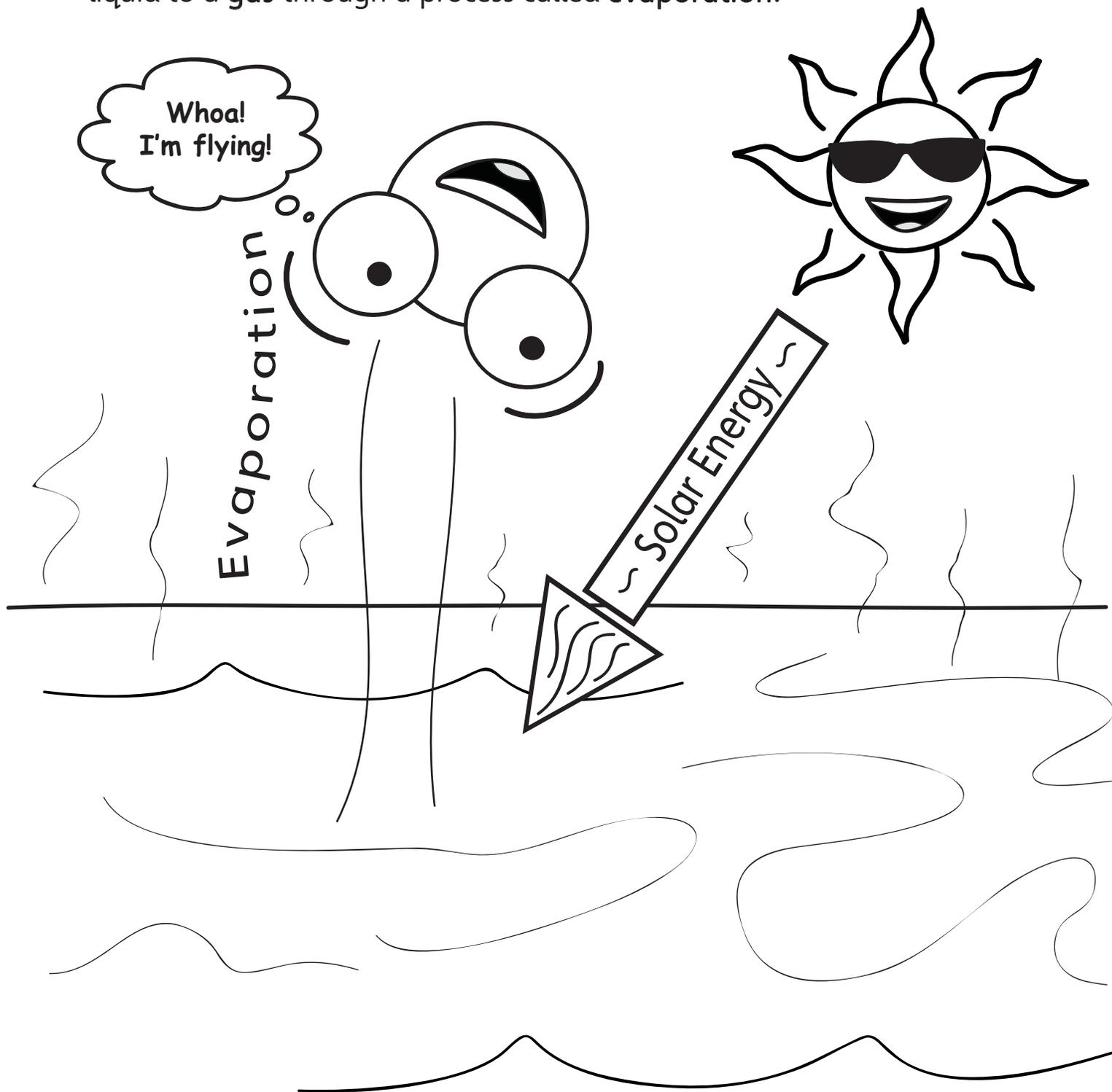
A few billion years passed like this, and as you might imagine, Marco started getting bored. Then, FINALLY, something interesting happened. Marco flowed up to the surface of the ocean, where solar energy warmed him. The Sun's rays felt SOOOOOOOOOO good!

The Sun
It's ALWAYS heating the Earth, even when you can't see it!



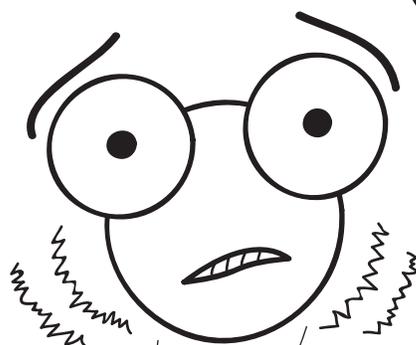
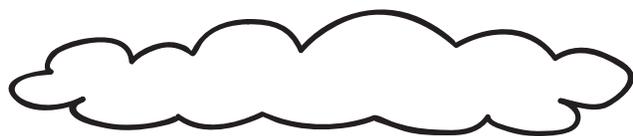
Marco soaks up some rays.

Marco kept getting warmer and warmer until he was suddenly flying through the air! Incredibly, the Sun's energy transformed him from a liquid to a gas through a process called evaporation.



Marco likes **evaporating**: changing from a **liquid** to a **gas**.

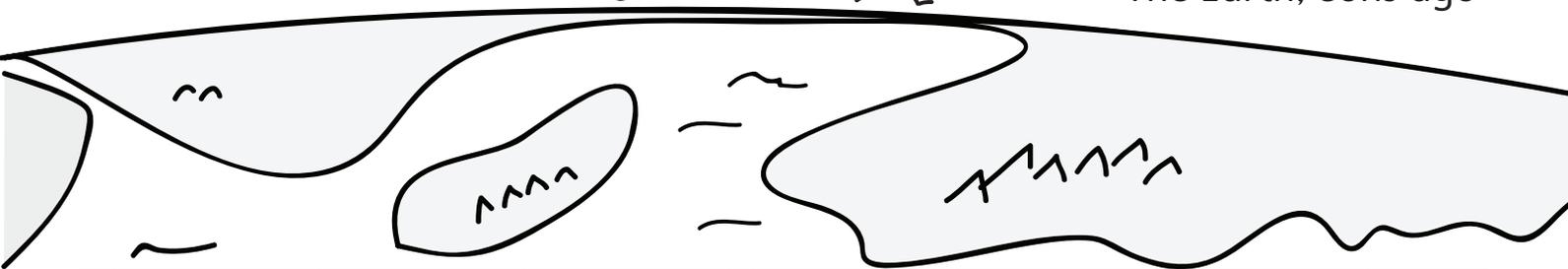
Marco didn't understand evaporation, but he was still very happy as he looked out over the enormous blue world. As a gas called **water vapor**, he could rise higher and higher in the air, but as he did he became colder and colder and COLDER. This made him feel really strange, and soon he could feel himself slowing down.



Marco gets cold as he rises high up in the **atmosphere**.



The Earth, eons ago

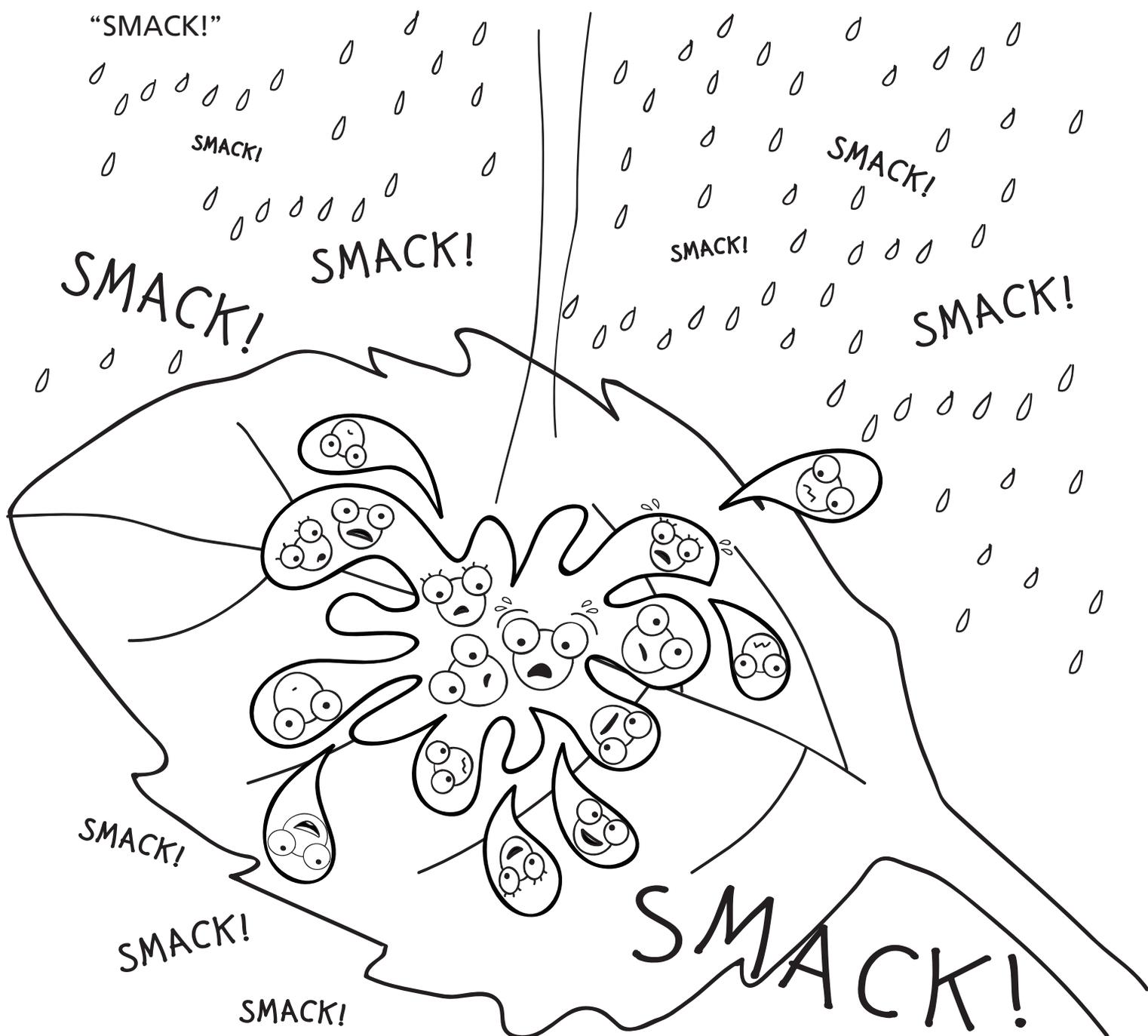


The nice thing was, this gave him a chance to look around more, and he noticed up above him GIGANTIC, fluffy white puffs. He didn't know what they were called, so he just thought...



PART 3: PRECIOUS PRECIPITATION

Marco didn't realize that his drop was just a VERY tiny part of a tremendous rainstorm, but he suddenly became aware of a terrifying sound rising from below him. As gravity pulled him ever lower, the thick rumble grew louder and louder, until Marco at last heard countless little "SMACKS!" as other raindrops hit something—hard. He braced himself, and a second later he, too, had collided with something and made a little "SMACK!"

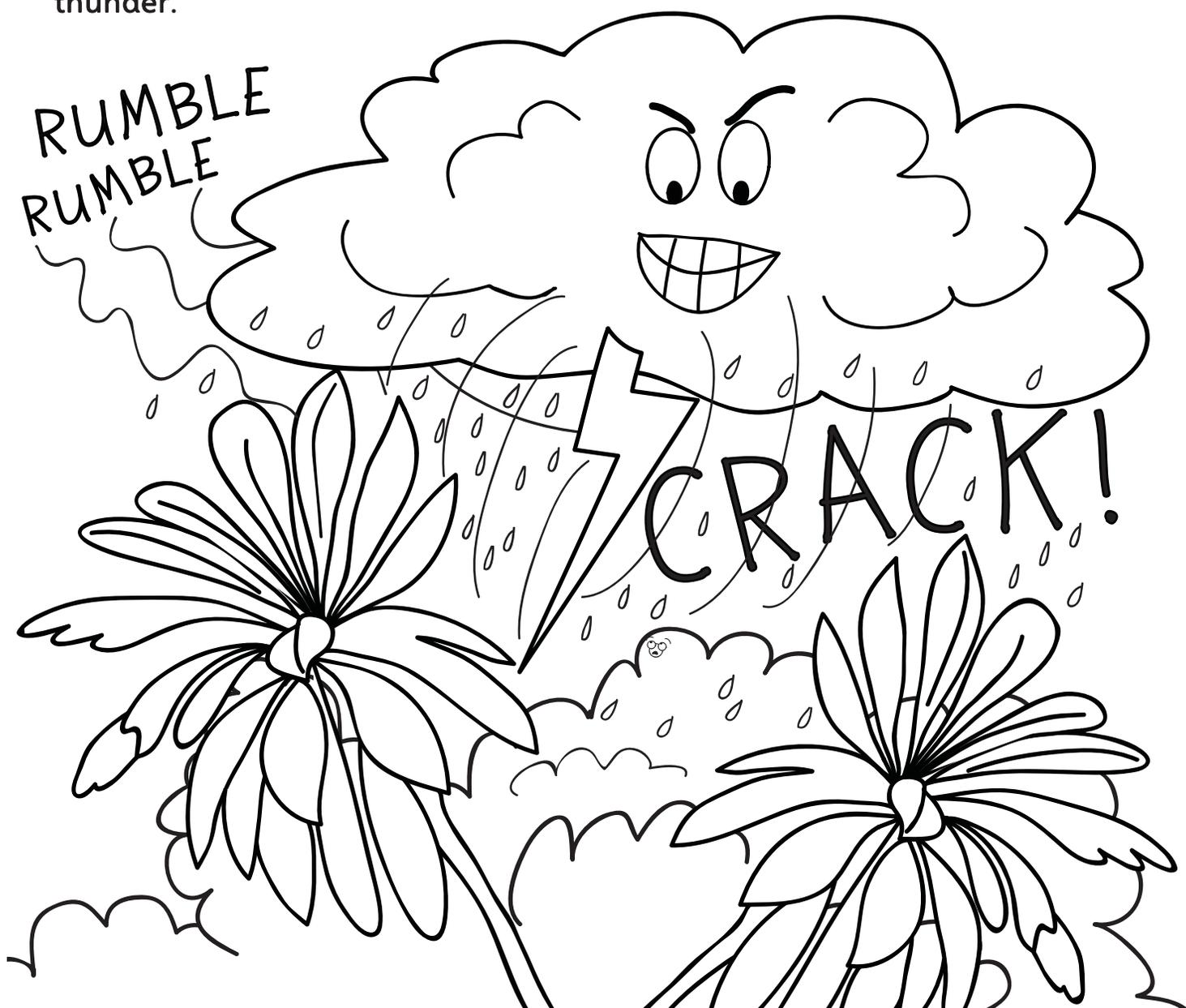


What Marco hit was the very top of an ancient tree in a vast rainforest. Of course, he had no idea what kind of magical place he had fallen into, since he had never even SEEN a tree before. But as he splashed off one of the leaves, all he could see below him was GREEN in every direction. It was the most beautiful place he had ever seen, and he stopped being afraid.



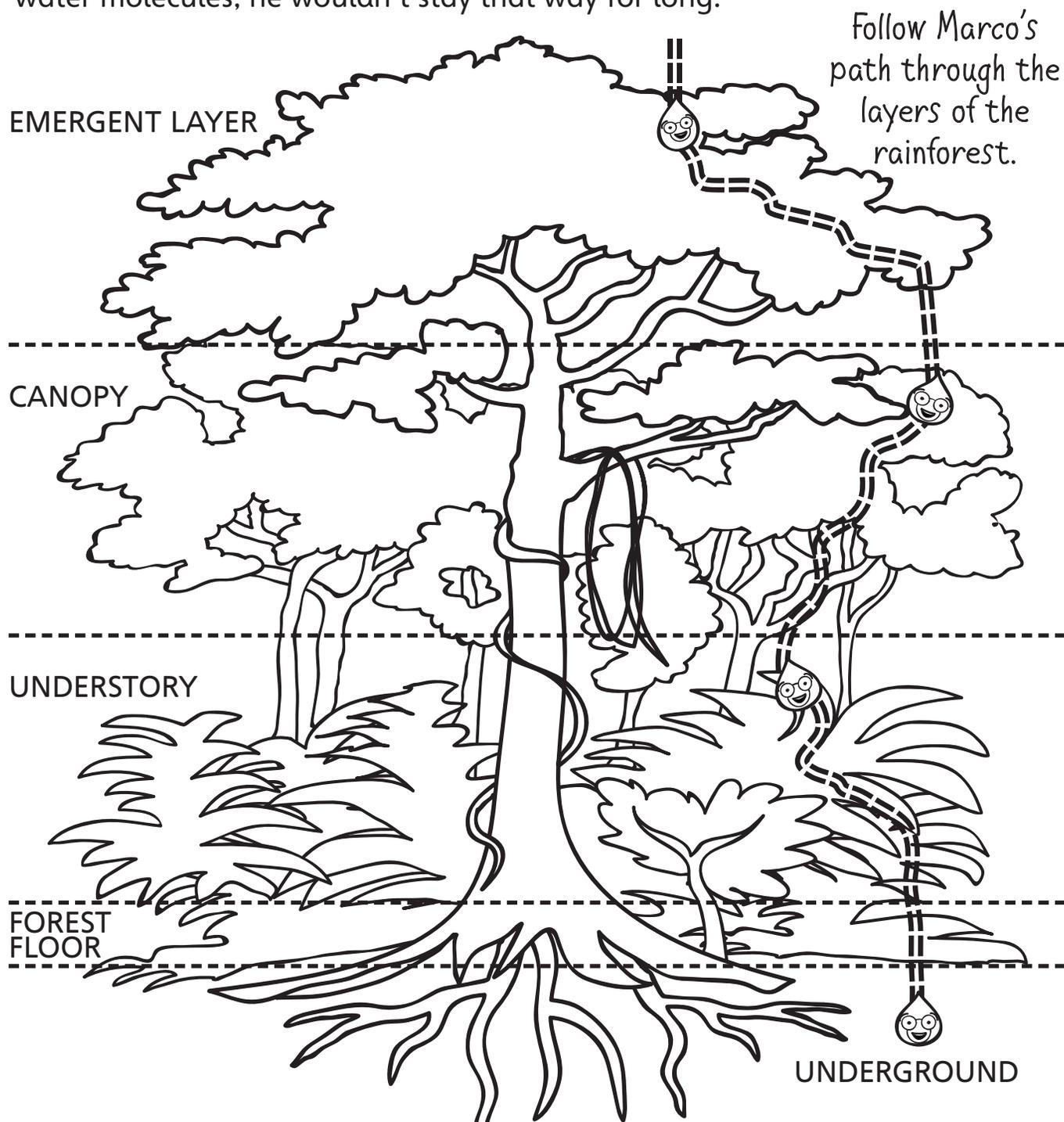
That was until he saw an intense flash of light, followed by the LOUDEST sound he had ever heard. “CRRAACKKK!!!!” At this point Marco thought the world might, in fact, be ending, but after several more deafening cracks they got softer. Eventually, he heard only distant rumbles, and the rain quieted, too.

Marco had just experienced his first **lightning**, and since the world hadn’t ended, he kind of liked it. He would have liked it even more if he had known that lightning is a super-hot burst of **electricity** that makes countless molecules in the air smack into each other, causing the loud rumbles of **thunder**.



Over the next several hours, Marco managed to drip down through the layers of the rainforest: the **emergent layer** he had fallen on, the broader **canopy** of trees below, then the **understory** made up of shorter plants like ferns, and finally the **forest floor**.

The heavy rain had soaked the ground, and Marco found it easy to slip below the surface. At that point he became **groundwater**, but unlike a lot of water molecules, he wouldn't stay that way for long.

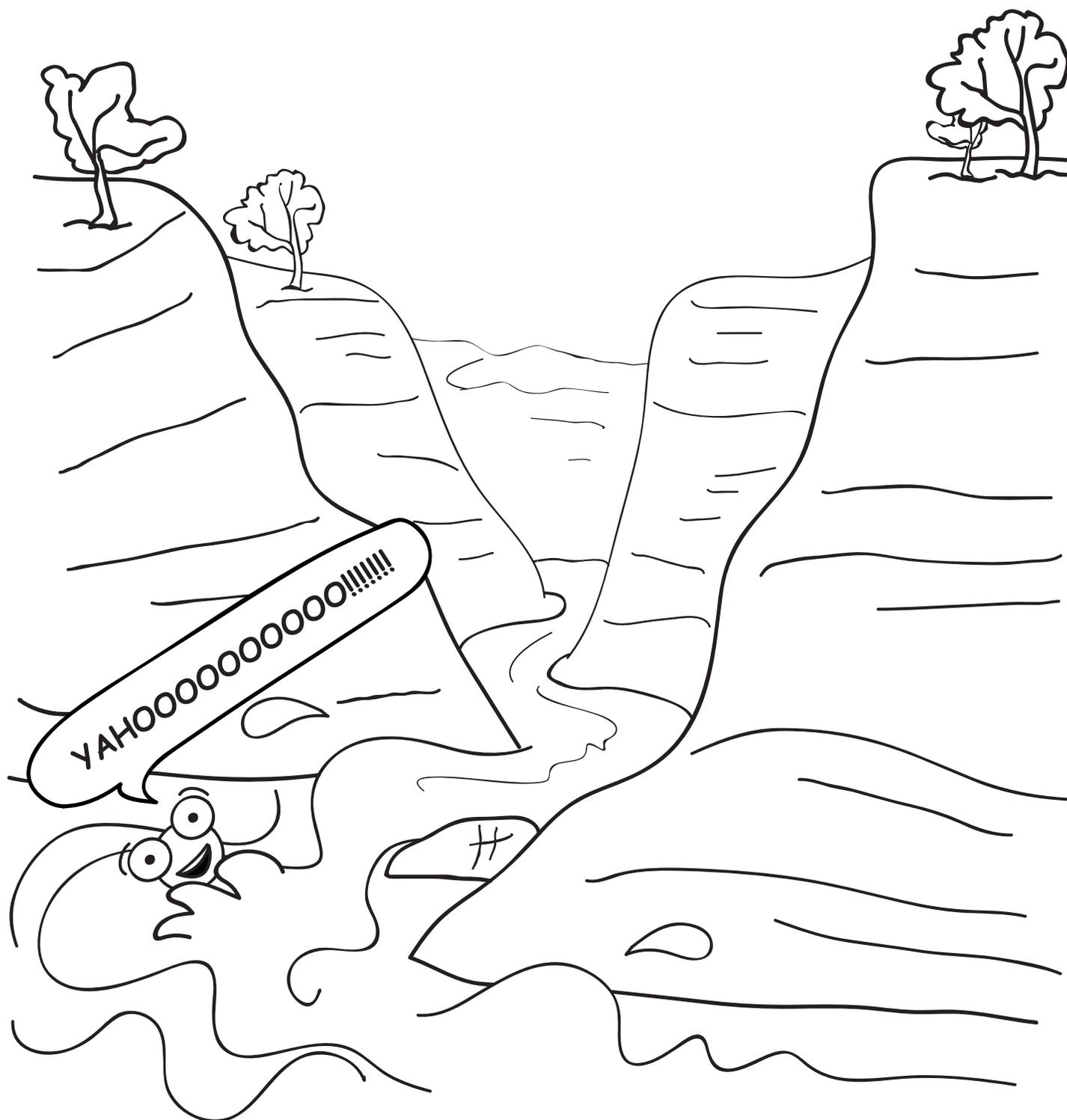


PART 6: THE RUNOFF RUN-WITH HURDLES

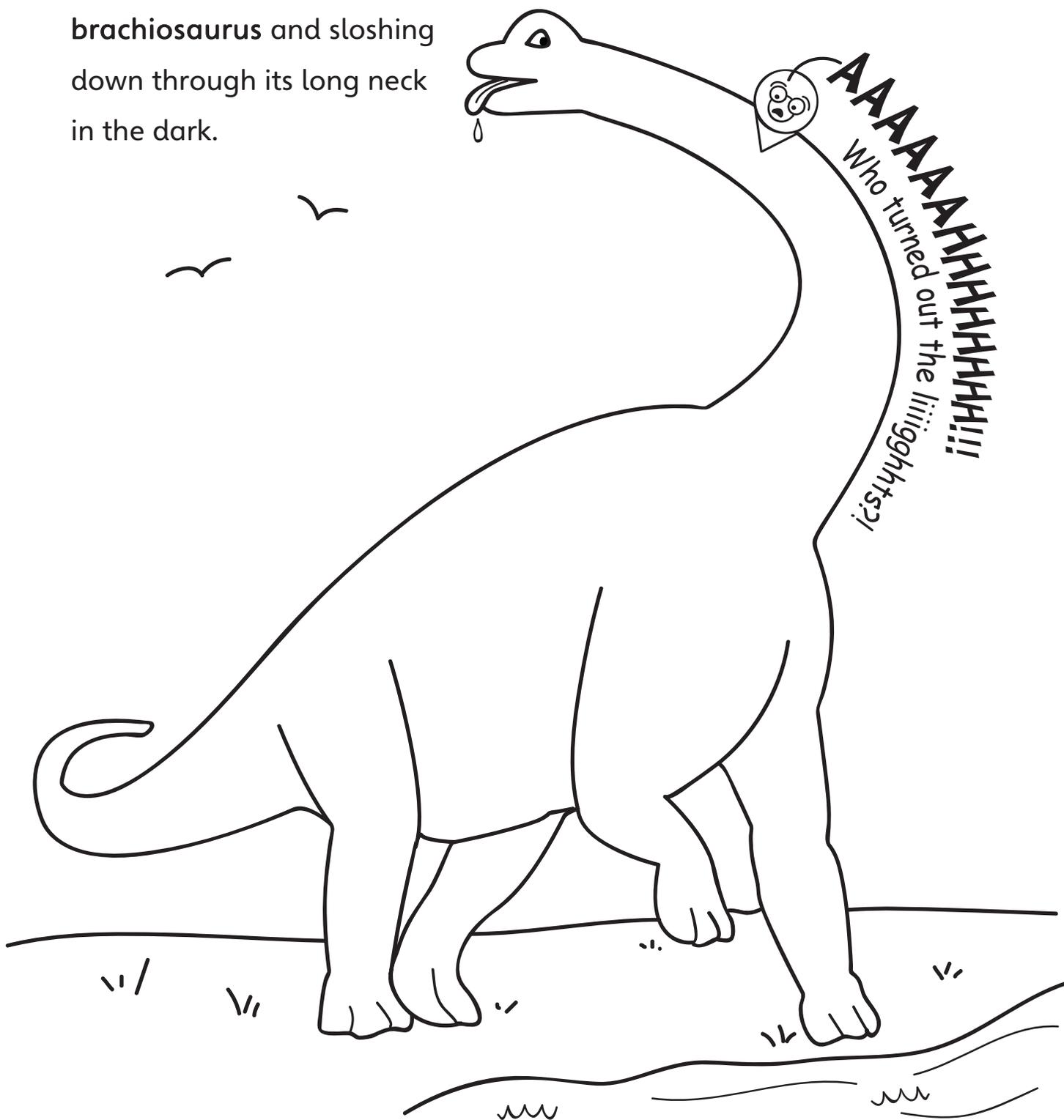
When spring finally did come, things happened fast. The sun warmed Marco's layer of snow and ice, and soon it **melted**. At last, he could move freely again as liquid water! He flowed quickly down the mountain in a small stream, part of the **headwaters** of a raging river. Other streams fed into his, and soon he was part of the swelling river. This is what he had been waiting for! It was just like old times when he traveled in the ocean currents, only better!



Marco felt powerful as he worked with all the other molecules to **transport** rocks and soil **downstream**. It's a good thing he didn't know that this process, called **erosion**, was working to carve out the enormous **canyon** he was passing through. If he had, he might have started thinking he was a little **TOO** powerful. With a "YAHOOOOOOOOO!" he sped down through a section of **whitewater rapids** and eventually out to a broad, flat **plain**.

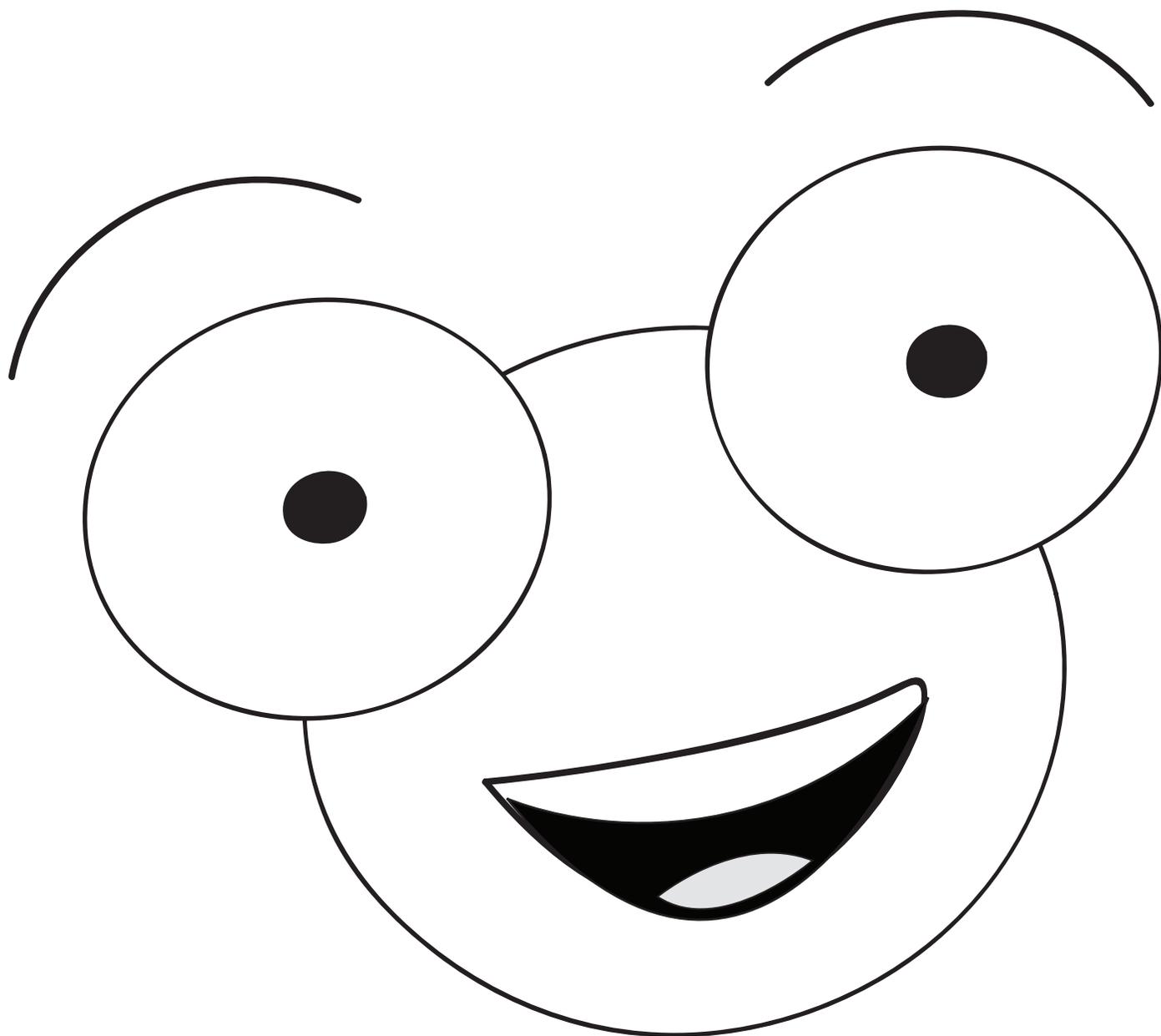


By that time he had slowed down, and he took the time to look around a bit. It's a good thing he did, or he wouldn't have seen the gigantic mouth opening wide to swallow him. He hadn't seen a mouth that big since his days in the ocean, and needless to say, it was quite a surprise. With one long, loud "SSLLUUUUURRRRP" he was now inside a HUUUUUUUUUGE brachiosaurus and sloshing down through its long neck in the dark.

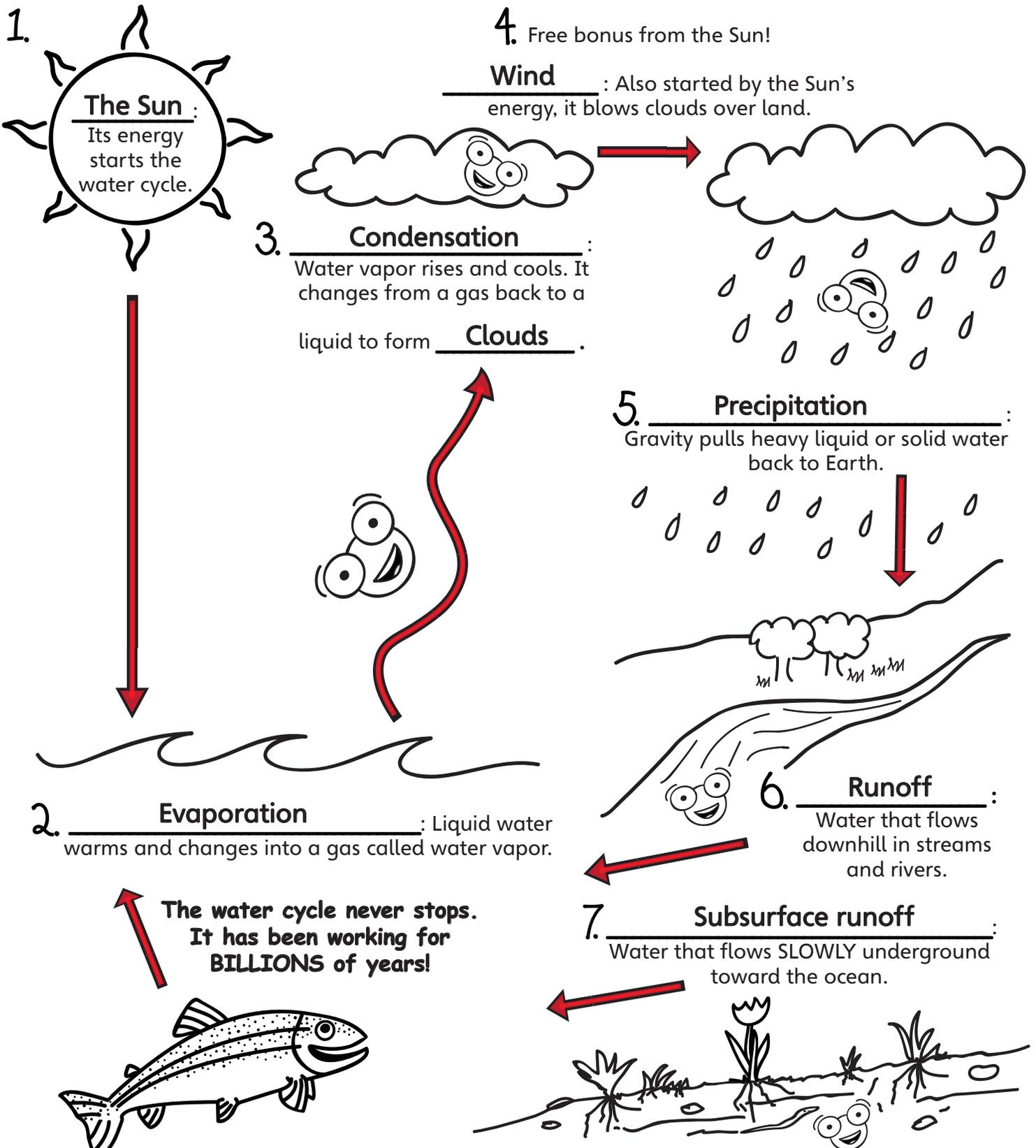


MARCO'S ANSWER KEYS

Try to look back in the story to find the answers to the puzzles,
but you can check them on the pages that follow!



MARCO'S MAGICAL WATER CYCLE ANSWER KEY



Word Bank:

Clouds, Condensation, Evaporation, Precipitation, Runoff, Subsurface Runoff, The Sun, Wind

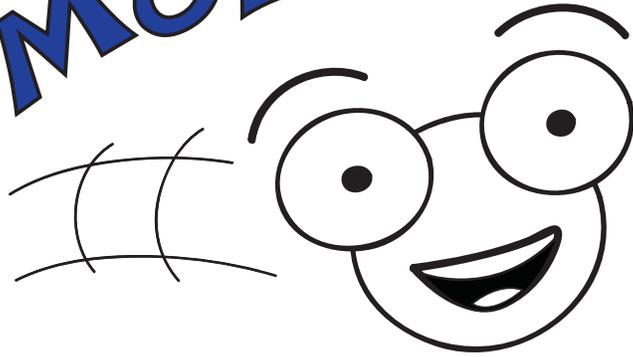
New!

MARCO

LA

MOLÉCULA

Translated to Spanish
by Marina La Grave



AND

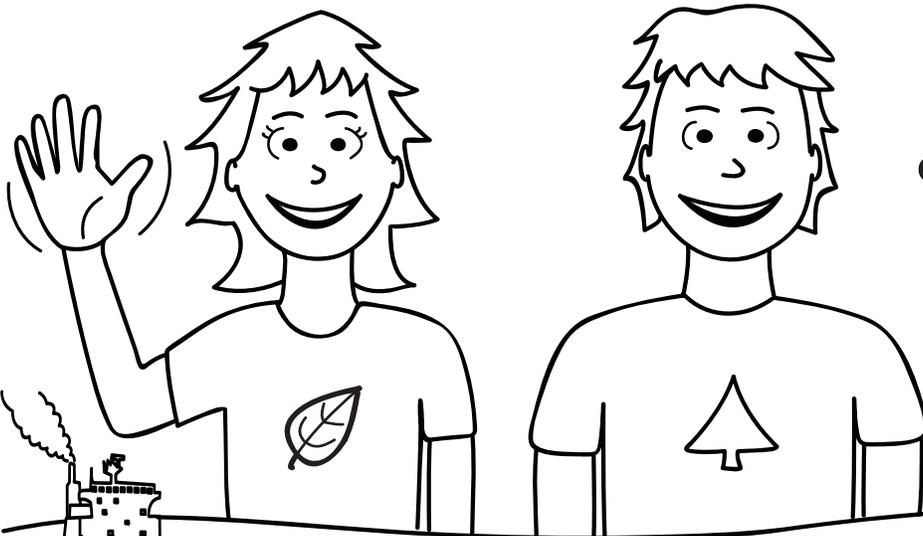
The
EverGreen Twins

Activity Book Second
Edition

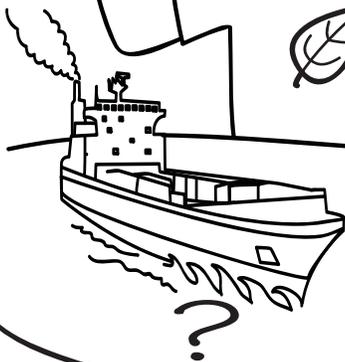
+ Teacher's Guide Coming Soon!

Engaging lesson plans aligned to standards

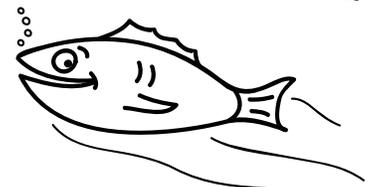
Adaptations / extensions to meet the needs of all learners



Learn more at
engagingpress.com



Rick Reynolds, M.S.Ed.





HAVE A BLAST WITH MARCO AND FRIENDS AS THEY EXPLORE THE WATER CYCLE AND PLANET EARTH!



Entertaining episodes and clear visuals make science easy to understand.



Engaging activities reinforce key concepts.



It's fun to color Marco's adventures and find him on every page.



Evaporation

RAVE REVIEWS FROM ALL AGES!

"My kids love Marco!! After one read, my 5- and 7-year-old describe the water cycle in detail. They are fascinated that everything in the world is made of molecules and are identifying all sorts of places where they might find Marco and his friends."

- Amy Hansen, Portland, OR

"I think it's exciting and really dramatic what happens to such a tiny thing!"

- Nathaniel Eddleman-Hanley, Age 10

"There are so many things I love about the book. It is awesome! I love learning about evaporation and I also love learning about how Marco did so much in the time of the dinosaurs. All the activities in the back, like the H₂O-ku and word search are awesome, too!"

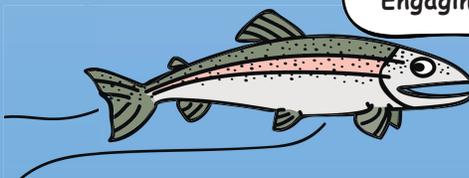
- Ben Petrie, Age 7



RICK REYNOLDS, M.S.ED. has been a passionate educator and developer of educational resources for 20 years. He is the author of several books, including *The EverGreen Twins Activity Book*.

Rick lives in Portland, Oregon, where he enjoys exploring the beautiful landscapes that Marco and his water molecule friends helped to create.

Learn more at [EngagingPress.com!](http://EngagingPress.com)



ISBN 978-0-9830016-1-4
\$12.95
5 1 2 9 5 >



9 780983 001614



Printed in Portland, Oregon on 40-100% post-consumer waste recycled paper and bound with 100% recycled plastic Eco-Coil.

Eco-Coil binding lets book open flat and flip backwards!