

Daisy's BIG Day



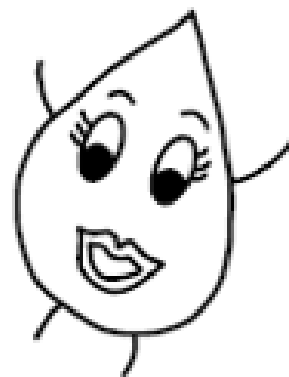
Daisy's Big Day

Written and illustrated by
Molly Goergen, Alexandra Haritos, and Ricky Vehar.

Dear Readers,

This book is for all the curious minds that seek to understand the world around them. We hope this story sparks an interest in science and a sense of adventure in you.

- Molly, Alexandra, and Ricky



"Daisy's Big Day is sure to be a hit for children and parents alike, having fun while learning about the important work Team Ohio EPA does every day to keep Ohio families safe! I'm proud of Alexandra, Ricky, and Molly for their creativity, hard work, and commitment to public service on behalf of all Ohioans!"

- Director Anne Vogel



From left to right: Amy Klei (DDAGW Chief), Alexandra Haritos, Ricky Vehar, Molly Goergen, Director Anne Vogel

Special thanks to Director Anne Vogel, DDAGW Chief Amy J. Klei, DDAGW Assistant Chiefs Tanushree Courlas and Justin Burke, and all those who helped us along the way.

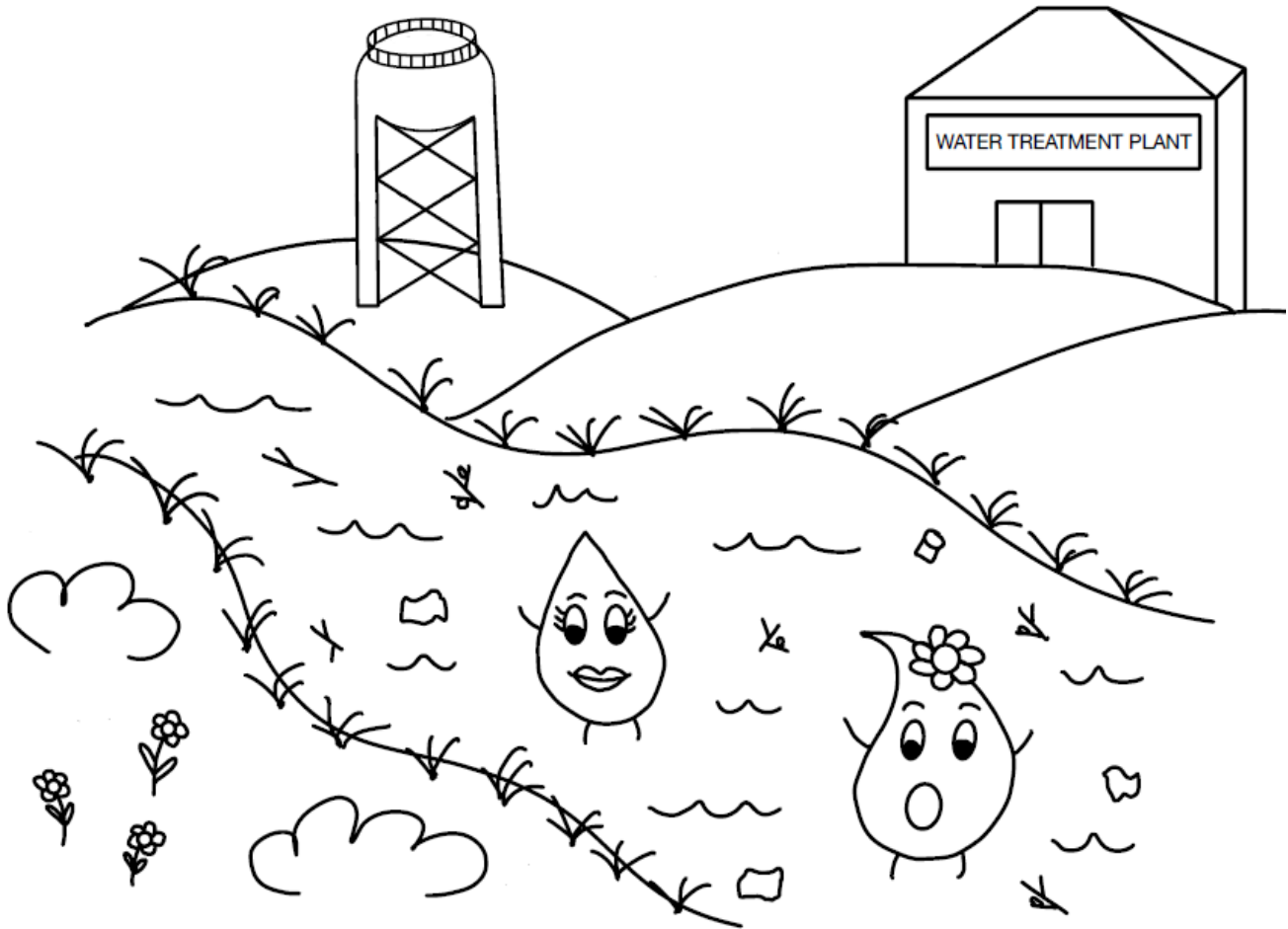
Relevant vocabulary words are in bold.

This resource meets State Science Standards for grades 3-5. The specific standards listed below are met. These Standards are from the Ohio's Learning Standards and Model Curriculum for Science (adopted 2018-2019).

<p>Earth's Surface</p> <p>This topic focuses on the variety of processes that shape and reshape Earth's surface.</p>	4.ESS.1	<p>Earth's surface has specific characteristics and landforms that can be identified.</p>	<p>About 70 percent of the Earth's surface is covered with water and most of that is the ocean. Only a small portion of the Earth's water is freshwater, which is found in rivers, lakes, groundwater and glaciers. Earth's surface can change due to erosion and deposition of soil, rock or sediment. Catastrophic events such as flooding, volcanoes and earthquakes can create landforms.</p>
	4.ESS.2	<p>The surface of Earth changes due to weathering.</p>	<p>Rocks change shape, size and/or form due to water or glacial movement, freeze and thaw, wind, plant growth, acid rain, pollution and catastrophic events such as earthquakes, flooding, and volcanic activity. Note: Differentiating between chemical and physical weathering is not the focus at this grade level.</p>
	4.ESS.3	<p>The surface of Earth changes due to erosion and deposition.</p>	<p>Liquid water, wind and ice physically remove and carry rock, soil and sediment (erosion) and deposit the material in a new location (deposition). Gravitational force affects movements of water, rock and soil.</p>

<p>Earth's Resources</p> <p>This topic focuses on Earth's resources. While resources can be living and nonliving, within this strand, the emphasis is on Earth's nonliving resources, such as water, air, rock, soil and the energy resources they represent.</p>	3.ESS.1	<p>Earth's nonliving resources have specific properties.</p>	<p>Soil is composed of pieces of rock, organic material, water and air and has characteristics that can be measured and observed. Use the term "soil", not "dirt". Dirt and soil are not synonymous. Rocks have specific characteristics that allow them to be sorted and compared. Rocks form in different ways. Air and water are also nonliving resources. Note: Rock classification is not the focus for this grade level; this is found in grade 6. At this grade, the observable characteristics of rocks can be used to sort or compare, rather than formal classification.</p>
	3.ESS.2	<p>Earth's resources can be used for energy.</p>	<p>Renewable energy resources, such as wind, water or solar energy, can be replenished within a short amount of time by natural processes. Nonrenewable energy is a finite resource, such as natural gas, coal or oil, which cannot be replenished in a short amount of time.</p>
	3.ESS.3	<p>Some of Earth's resources are limited.</p>	<p>Some of Earth's resources become limited due to overuse and/or contamination. Reducing resource use, decreasing waste and/or pollution, recycling and reusing can help conserve these resources.</p>

Once upon a time, there was a droplet named Dew. She went on a wonderful adventure through the water cycle and at the end of her journey, she found herself in a river next to a nervous droplet. This is where our story begins.



Dew turns to the nervous droplet and says, "Hi, I'm Dew! There's no need to be nervous! When I was young, I went on a wonderful adventure and soon you will too!"

The drop replies, "Hi Dew, I- I'm Daisy, I've heard the tales of other droplets and their adventures, but I've been in this river for as long as I can remember!"

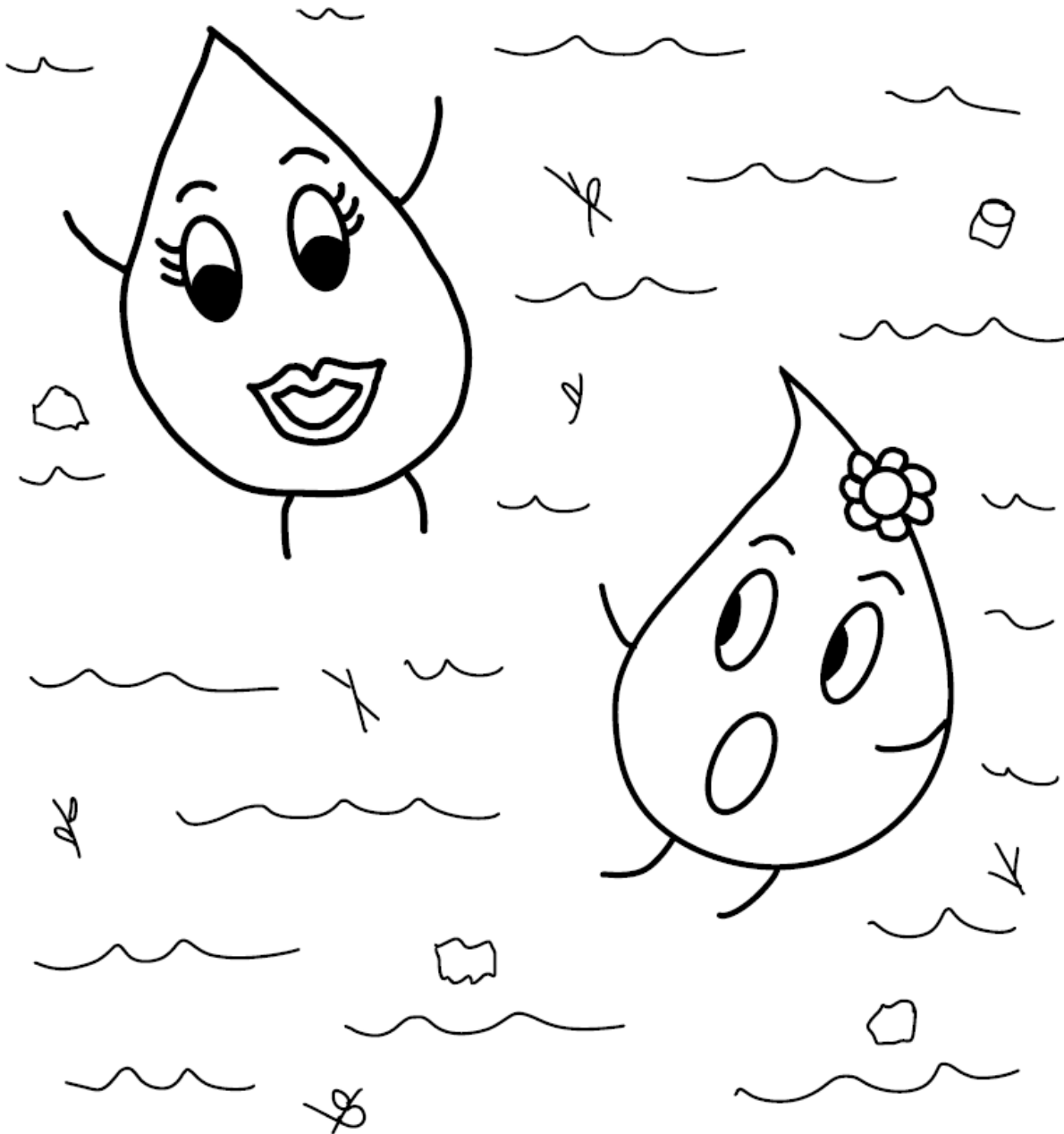
"Don't worry," Dew says, "You'll meet lots of friends to guide you on your way!"

"R-Really?" says Daisy.

Dew replies, "We can start together." So off they went, down the river they knew.

Suddenly, a current comes by and pulls Daisy away from Dew. As she is whisked away, she screams, "Dew HEEELP!" But Dew is too far away to respond.

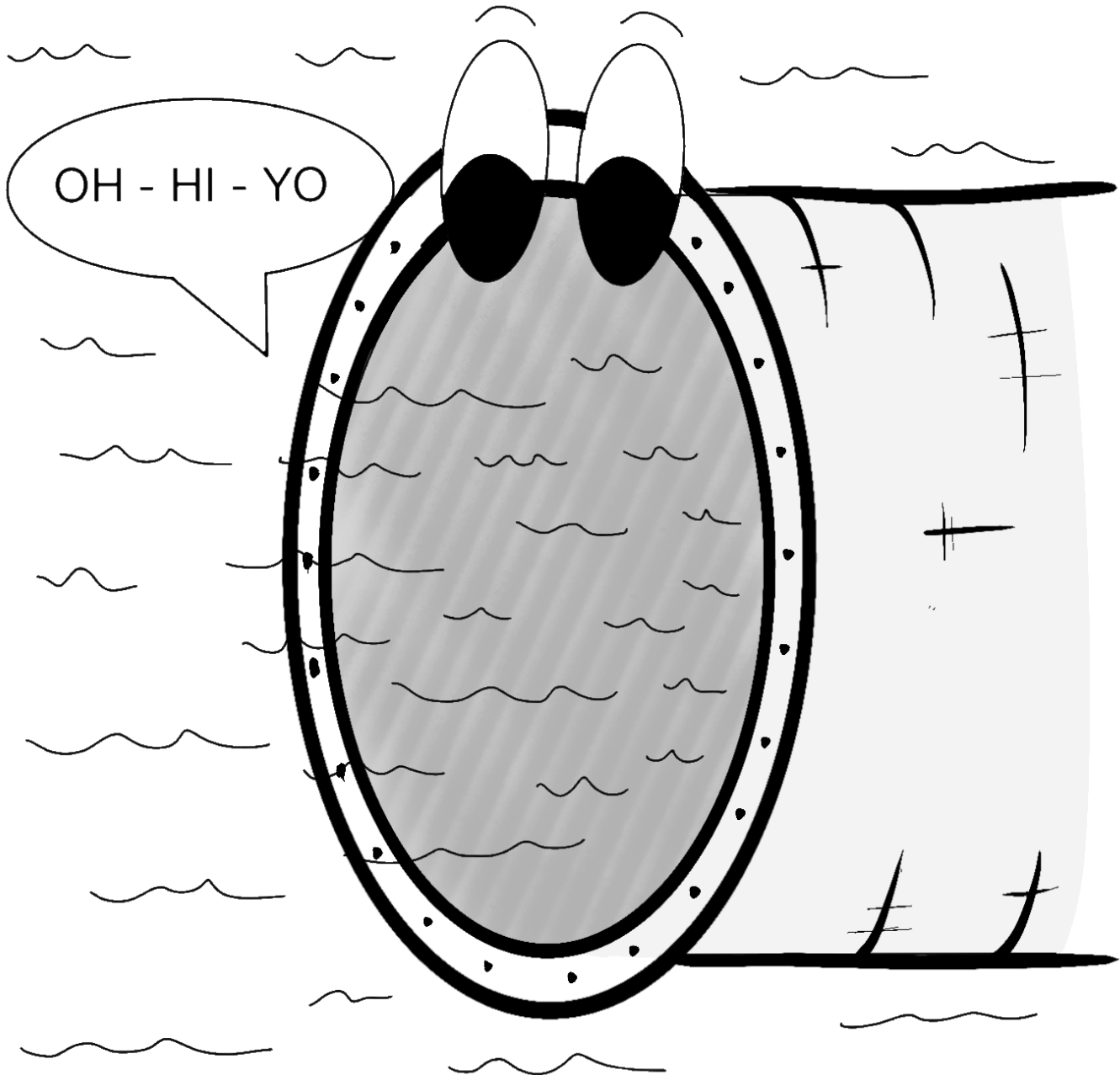
Daisy is on her own floating down the river, or so she thought...



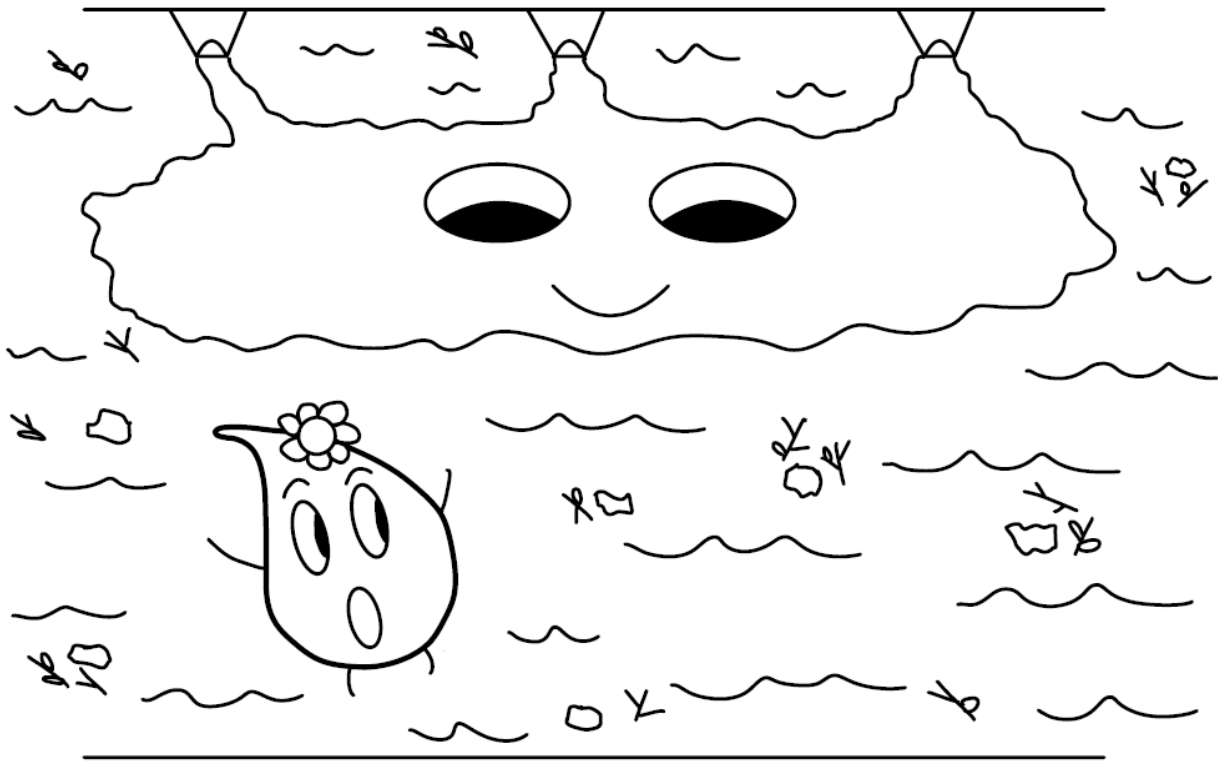
As the two float apart, Daisy hears a voice calling out to her, "Oh-hi-yo I'm Izzy **Intake**. This is where your adventure begins."

So off Daisy went through the **intake**. While floating through the dark, cold tunnel she asks, "Where am I?"

"I'm the **intake** to the water treatment plant," Izzy replies. "I bring the water into the plant and help to keep sticks and other debris out. Come on in, the water's fine!"



So Daisy flowed into the pipe. After some time, things started to pick up speed. As Daisy was swirling through the pipe, she noticed something around her.



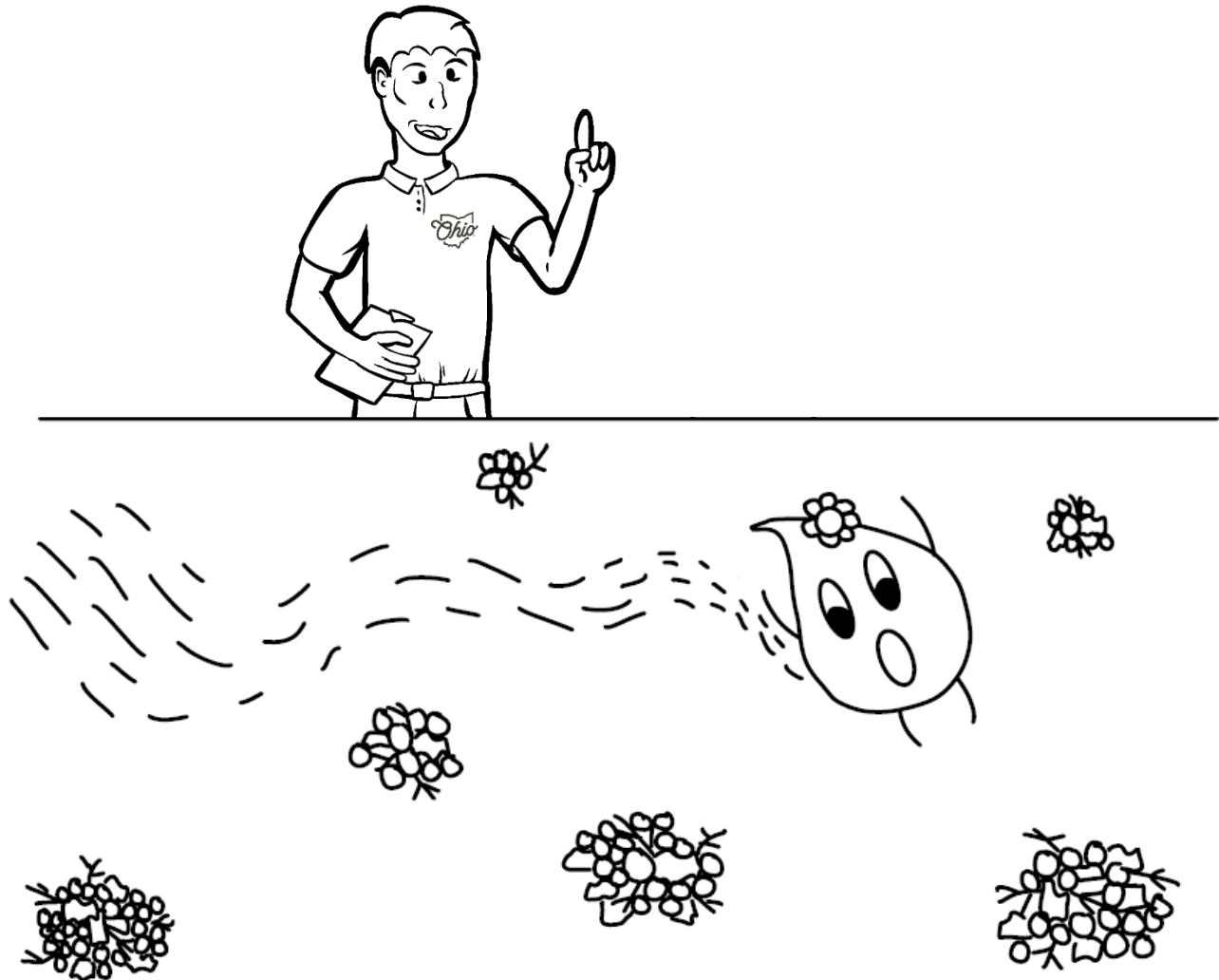
“Howdy! My name is Alvin **Alum**. You see all that dirt around ya? I’m a chemical that sticks all that dirt and some other yucky things together. This helps make the water clearer!”

“Wo- Woah, n- nice to meet you!” says Daisy.

“Likewise! Watch out for the rapid mixer just ahead! See ya!”

“The rapid wha- AHHHHH!” Daisy is suddenly swirled around through the pipe. Alvin becomes mixed in with her and the other droplets.

After a short time in the rapid mix, Daisy then finds herself in the **flocculation** basin. In a panic she screams, "SOMEBODY HELP ME!!!" as she sees a big goopy mass reaching for her.



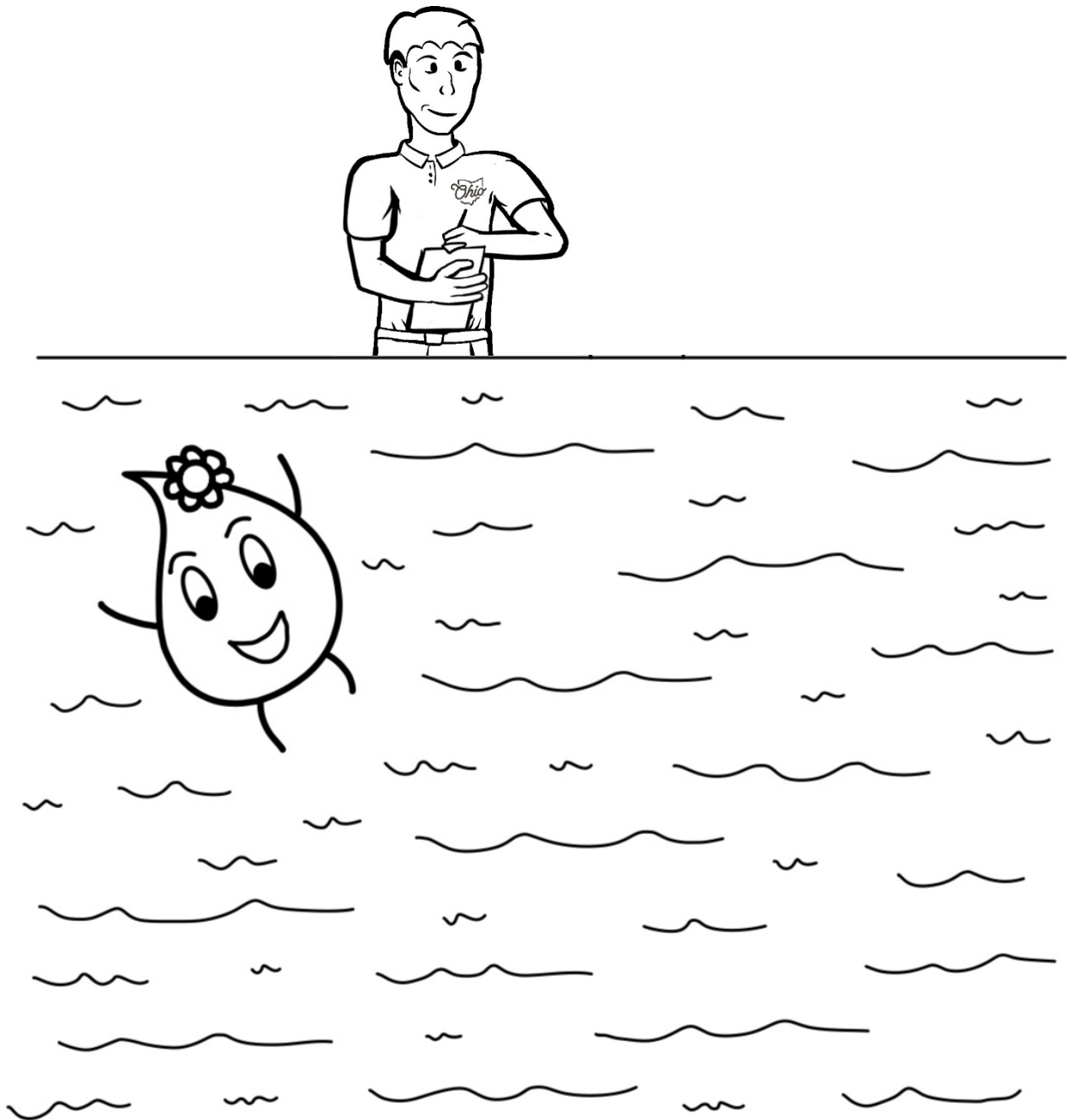
A very calm voice says, "Don't worry, you're in the **flocculation** basins, getting moved around to create **flocs**. A **floc** is what Alvin creates by sticking all the dirt and yucky stuff together. Everyone here is nice when you get to know them. That right there is Felix **Floc**. By the way, I am **Inspector** Colin."

Pointing to the logo on his shirt he says, "I work for the Ohio Environmental Protection Agency in the Division of Drinking and Ground Waters. My job is to make sure water treatment plants are working and keeping Ohioans safe."

Daisy replies a little shaken, "I- I'm Daisy, Daisy Droplet! This whole place has been quite the adventure."

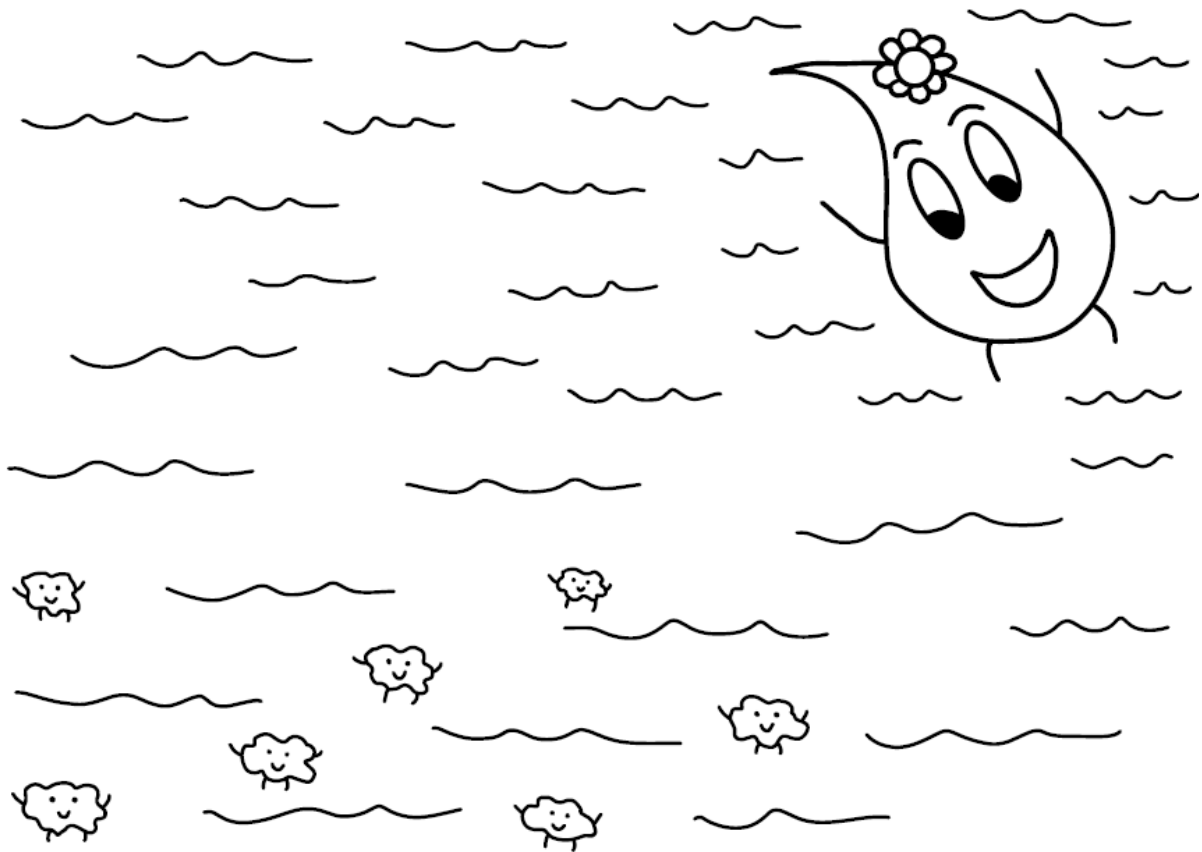
“Well, I can help guide you through the rest of your adventure!” the inspector reassures Daisy. “You’ll be here for a while, and the **flocs**, like Felix, will get bigger.”

Daisy continues through the basin, and she watches the **flocs** get bigger just like Inspector Colin said. Daisy is mesmerized by how slow the water moves and how relaxing this basin is, especially compared to the rapid mixer she was just in.

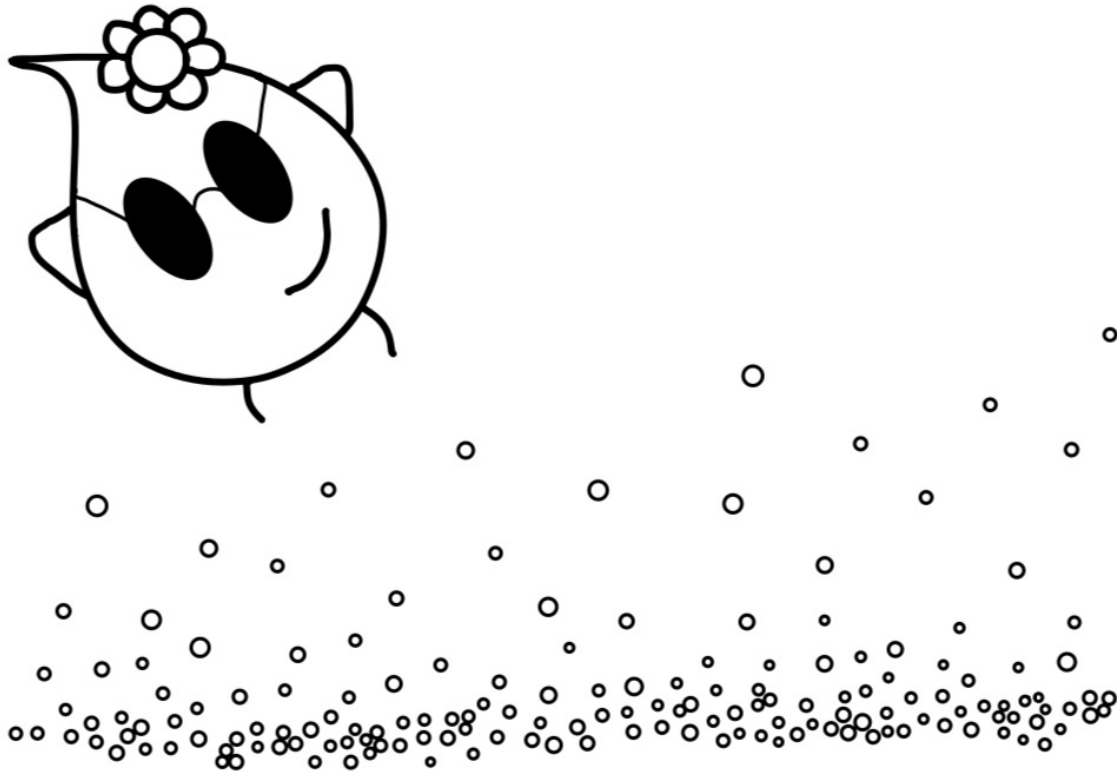


"Your next stop is the **sedimentation** basin just around the corner," the inspector said. As Daisy moves forward, she is suddenly in a much larger basin. "All the **flocs** around you are getting too heavy to float and will settle down where they can be collected."

"Bye Daisy!" the **flocs** call out. Daisy says, "Nice to meet you all!" and waves goodbye to the falling **flocs**.



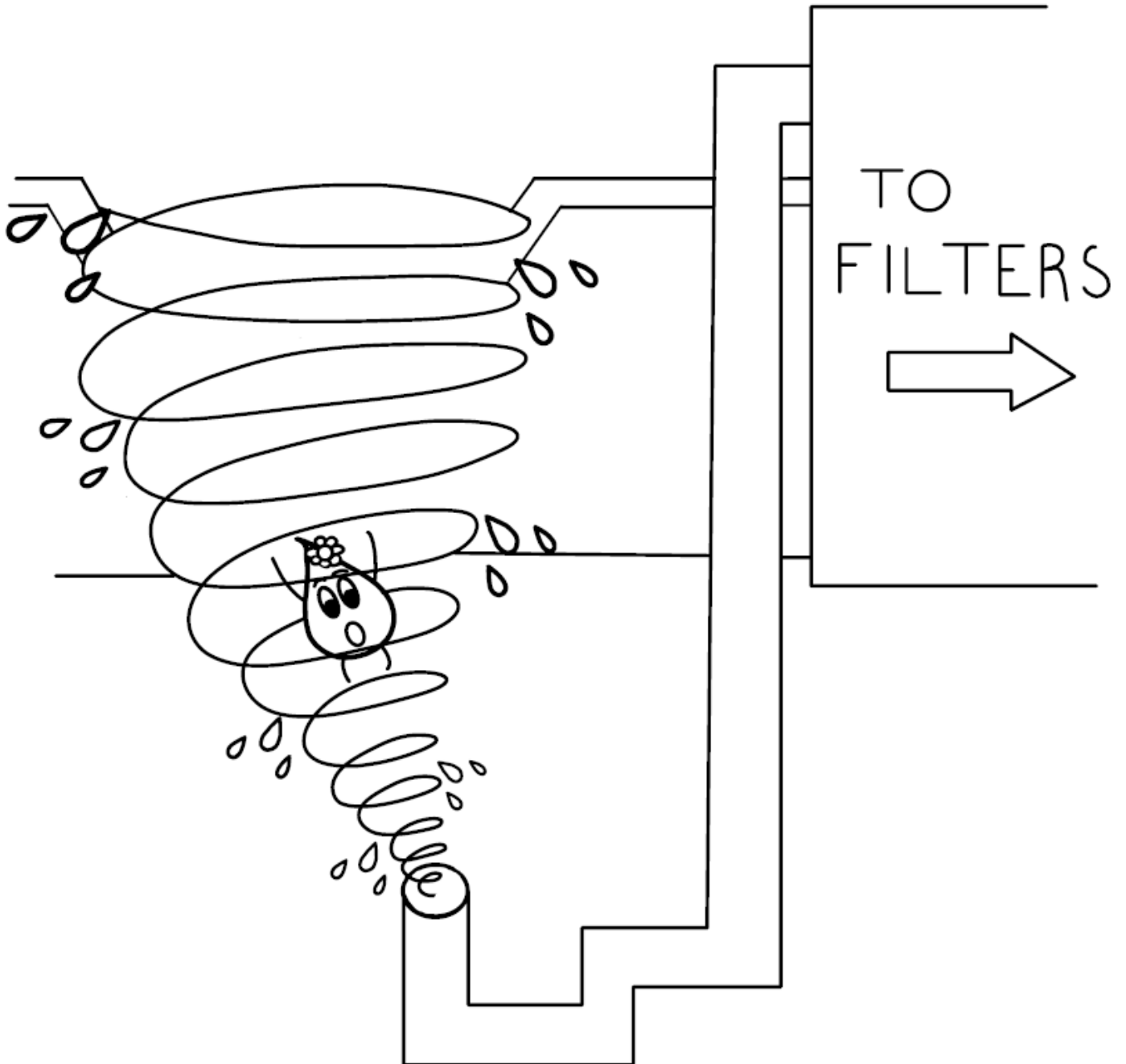
Daisy looks at the inspector and says, "Wow, you know so much! This process is much less scary knowing what is going on. Thank you!"



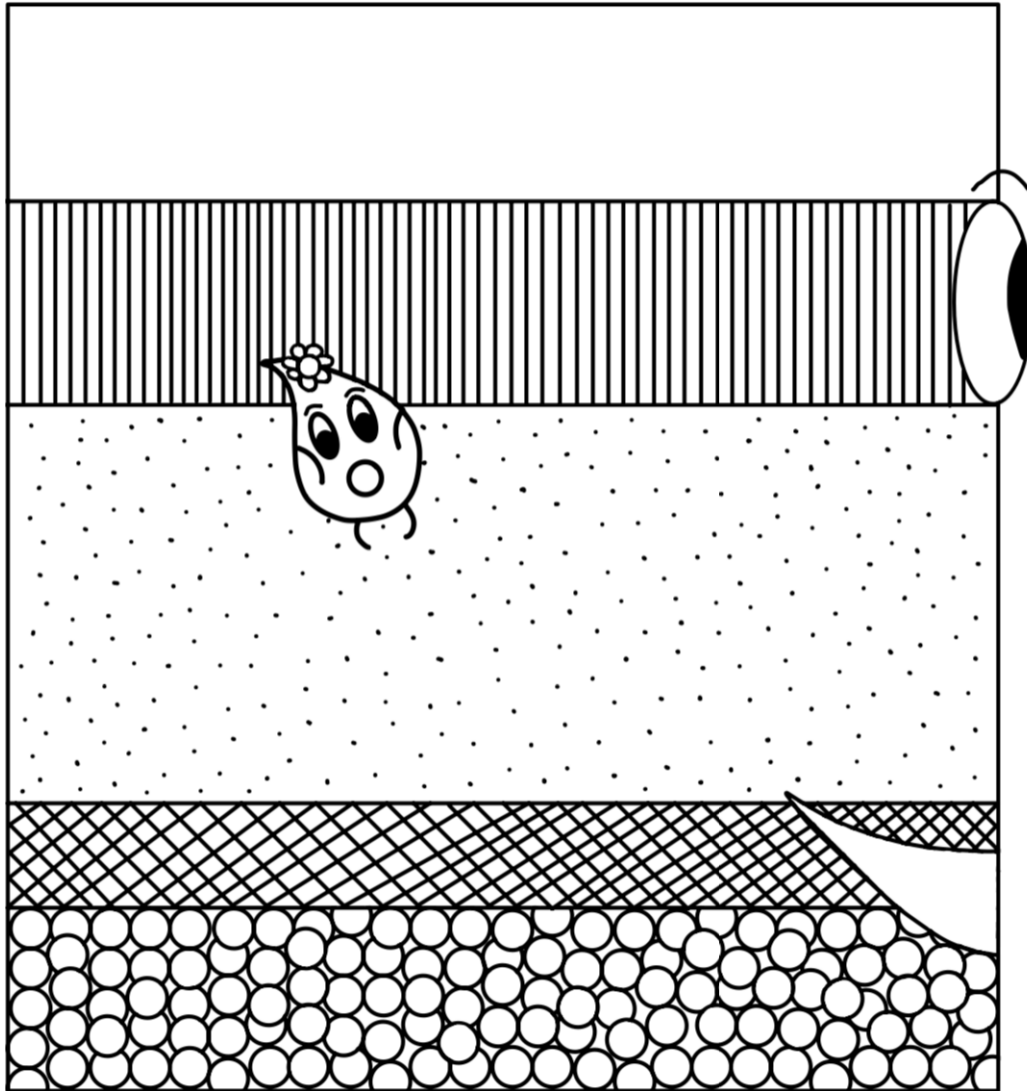
The Inspector nods in appreciation and says, "Happy to help! Now that almost all the **flocs** are settled, let's go over what's going to happen next since we won't be able to talk through this process."

Inspector Colin continues, "What comes next is called **filtration**. In this step, more of the yucky germs in the water will be taken out. After that, a chemical called **chlorine** is added for **disinfection**. Then **fluoride** is added to help make teeth strong. Finally, you'll head to the **clearwell**. That's where we'll meet again, and I'll introduce you to another one of my friends."

Daisy continues to relax in the **sedimentation** basin for a few hours. As she relaxes, she continues to rise to the surface. Eventually, Daisy flows over the **weir** and through the pipes. Off to the filters she goes!



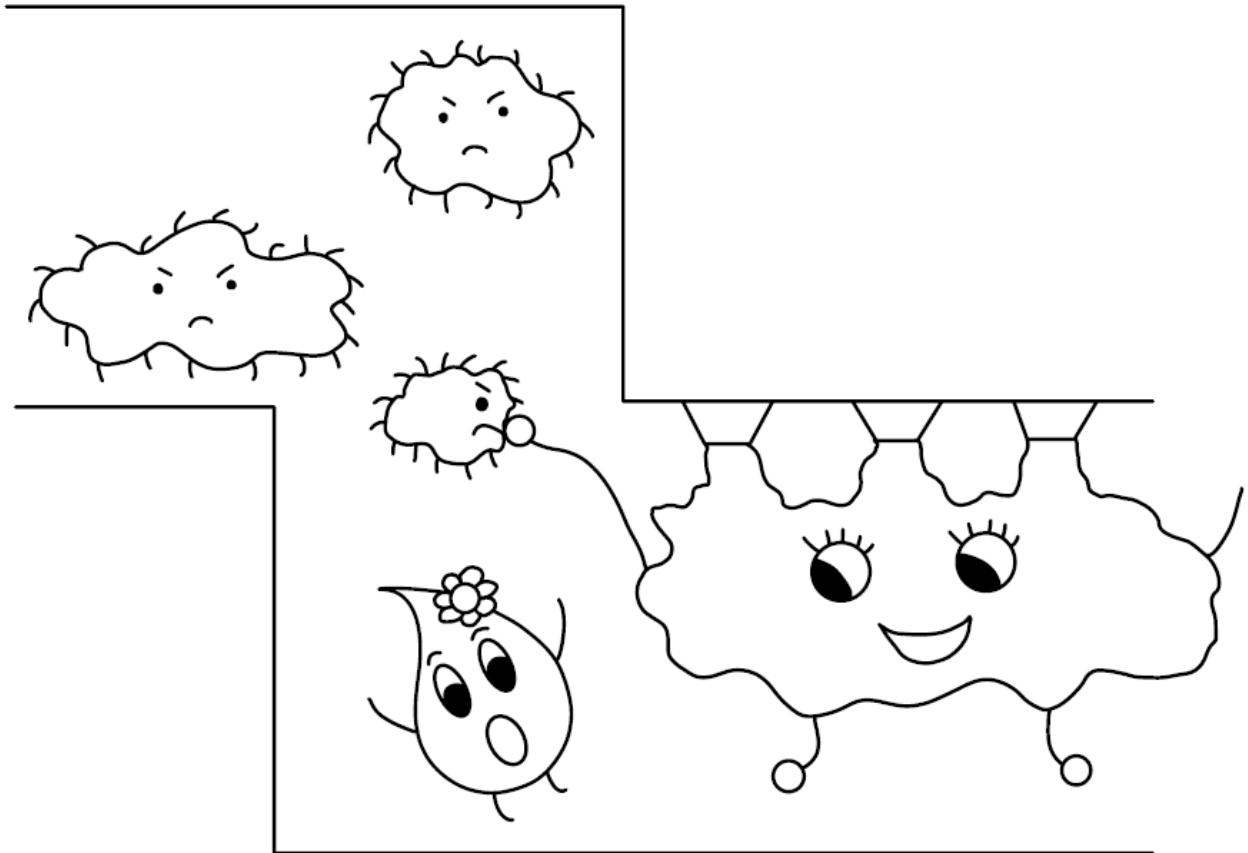
The pipe drops Daisy off in a room that looks similar to the riverbed she came from, filled with different sizes of rocks. Daisy begins to sink toward them, but she doesn't recognize what kind they are.



"Welcome little droplet!" A voice that surrounds her says. "I'm Fred **Filter**, and you're about to pass through my media. It might be a tight squeeze in spots; but, by the time you're out of here, you'll feel crystal clear!"

Daisy sinks into the rocks and begins to make her way through the cracks in between them. "The first layer is made of **anthracite**, a type of coal, and after that you'll pass through sand." Daisy squeezes her way through the sand before things began to loosen up. She slides past big pieces of gravel before being sucked into another pipe.

Daisy continues to flow through the now familiar pipes. As she moves along, she notices the water is much clearer than earlier, but a few small specks are still wiggling about. "**Bacteria!**" she squeals.



As she continues to move through the pipe, Daisy meets another friend. "Hi there, I'm Chloe **Chlorine**, and I help disinfect the water."

"What does that mean?" Daisy asks.

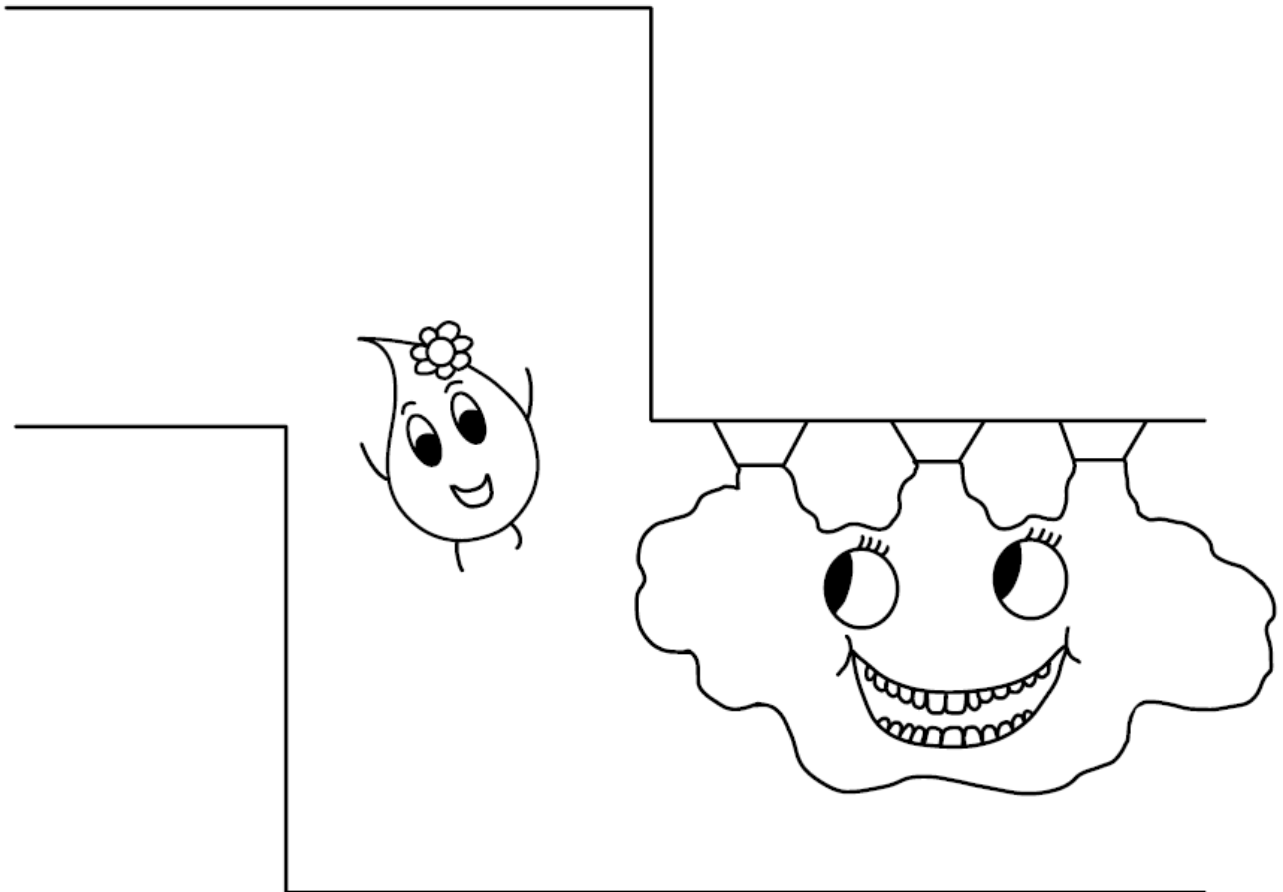
"Well, it means I take all the germs, like those bacteria, out of the water so people don't get sick," Chloe replied.

"Wow", said Daisy, "that is a really important job!"

Shortly after Chloe, another voice says, "Hiya! I'm Fiona **Fluoride**."

"What's your job?" Daisy asks excitedly.

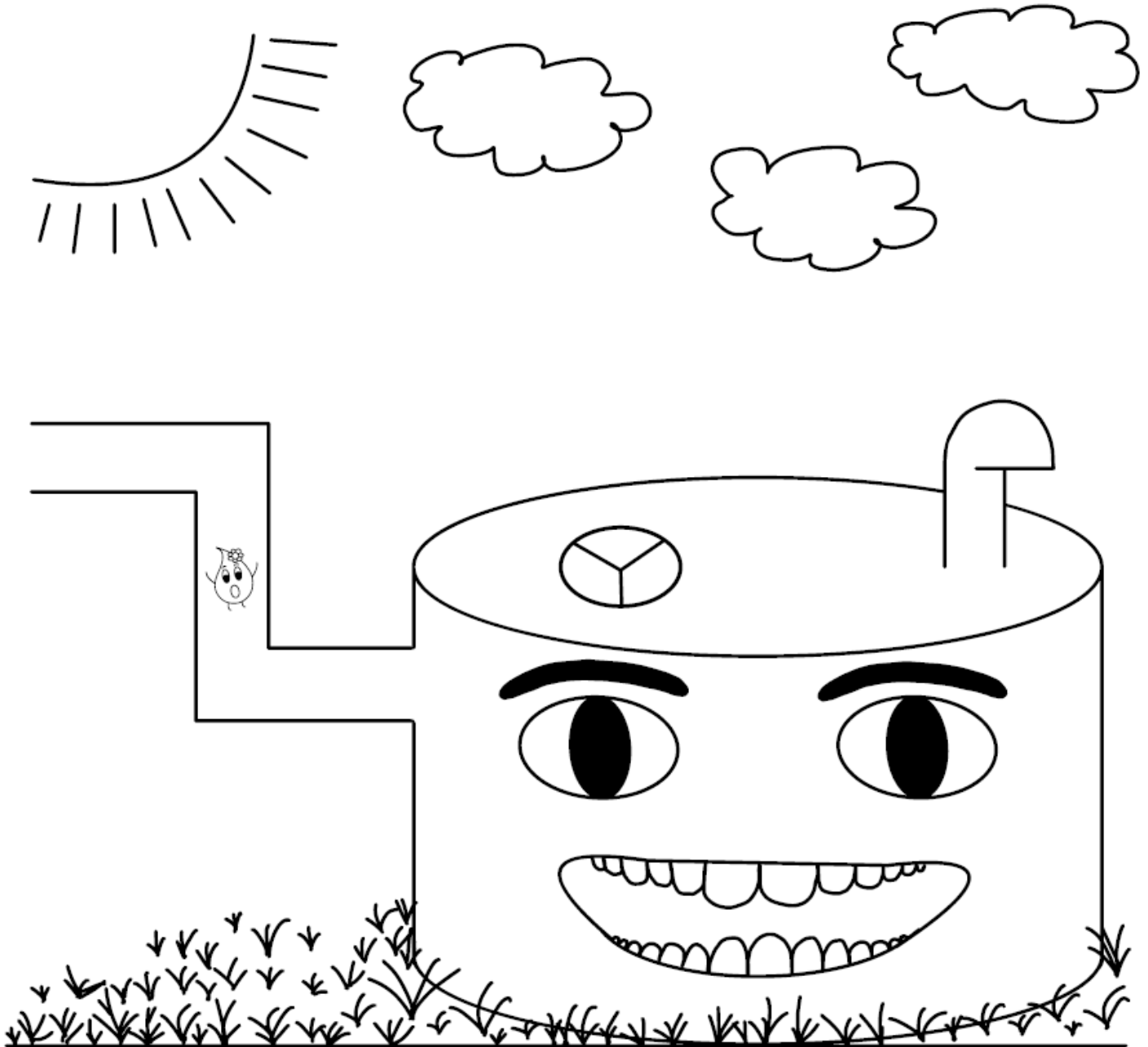
"They put me in the water to help strengthen teeth and prevent tooth decay for the humans!" Daisy, a little confused, asks Fiona to explain. Fiona continues, "I help strengthen teeth and prevent people from getting cavities."



Finally, the three of them enter another large basin.

“Looks like you made some friends, Daisy!” Inspector Colin said. “Let me introduce you to one of my last friends at the water treatment plant, Clarence **Clearwell!**”

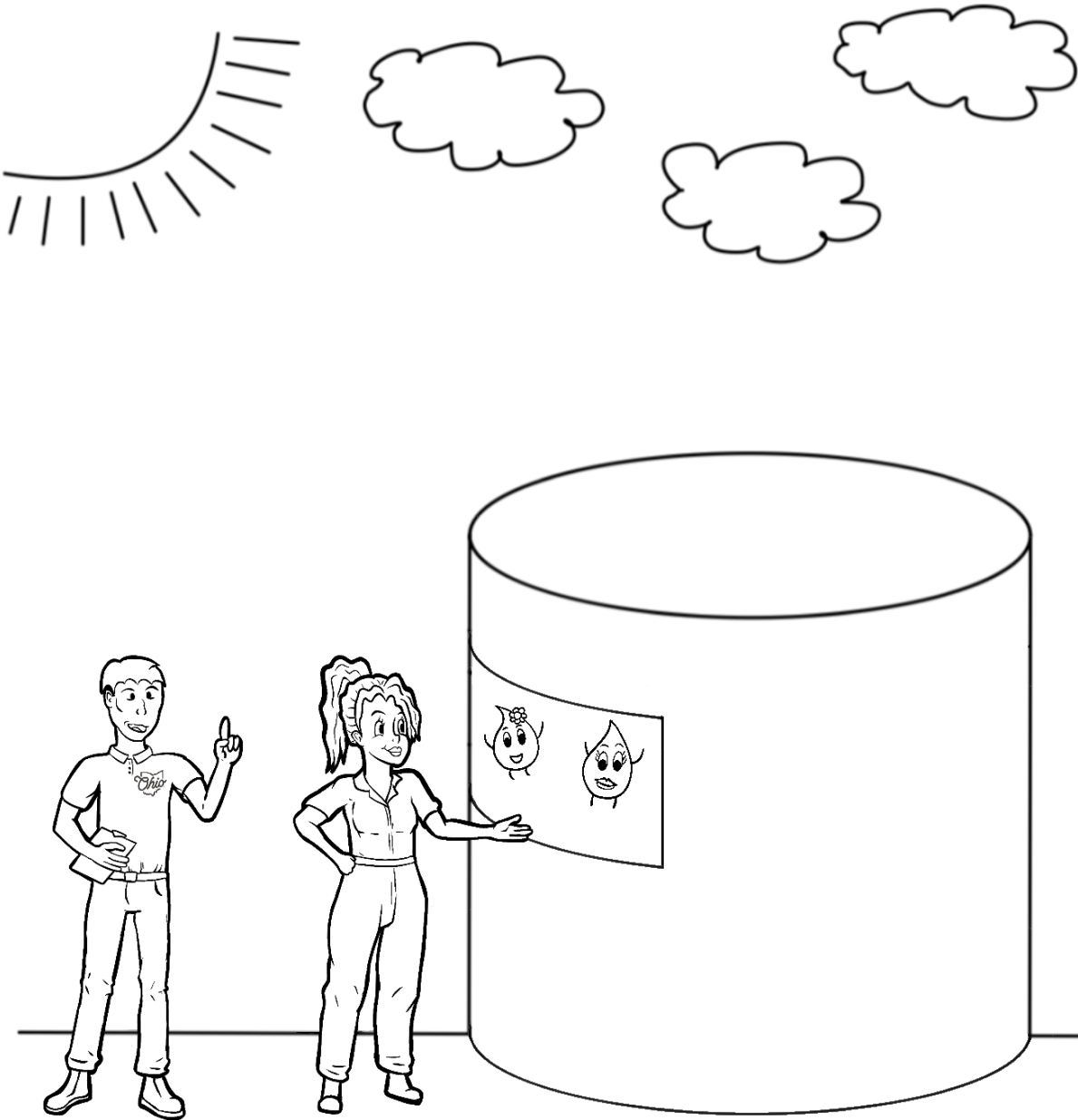
Clarence, says slowly, “Hello Daisy, I help make sure Chloe has time to disinfect and make sure no bad bacteria get to the community.”



Suddenly, Daisy hears a familiar voice calling out to her “Daisy, Daisy!” as Dew appears in the **clearwell**.

“Dew, I’m so happy you’re here! This is my friend, Inspector Colin.” Standing next to the inspector was someone Daisy had not met before. Inspector Colin sees her and shakes her hand.

“Daisy, this is the water treatment plant operator,” Inspector Colin says.



The Operator looks at Daisy and says, "Hi, it's nice to meet you. You look very clean. I am glad to see my plant is doing its job."

"Oh! I've been on the most amazing adventure!", Daisy excitedly responds.

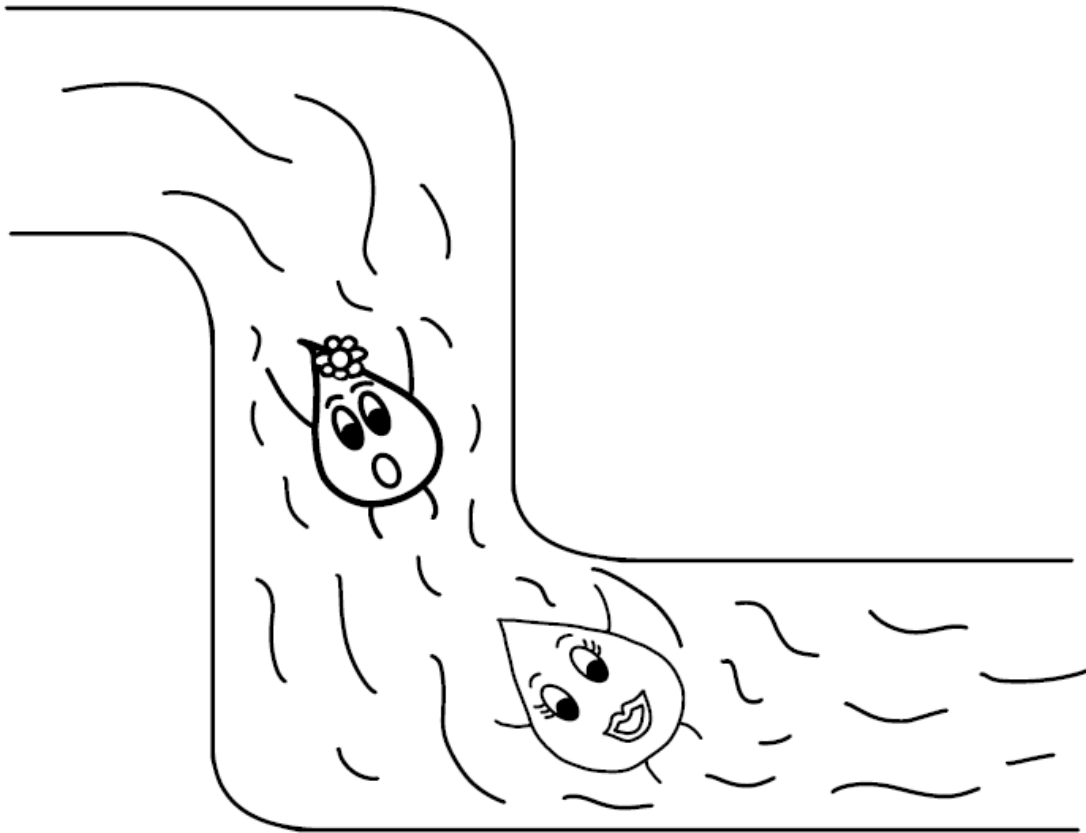


“And it’s still not done!” Dew interrupts.

“What do you mean?” Daisy replies.

“I’m going to take you along on the next part of our adventure through the distribution system!” Dew answers.

Both droplets wave goodbye as they float toward the last pipe in the water treatment plant.

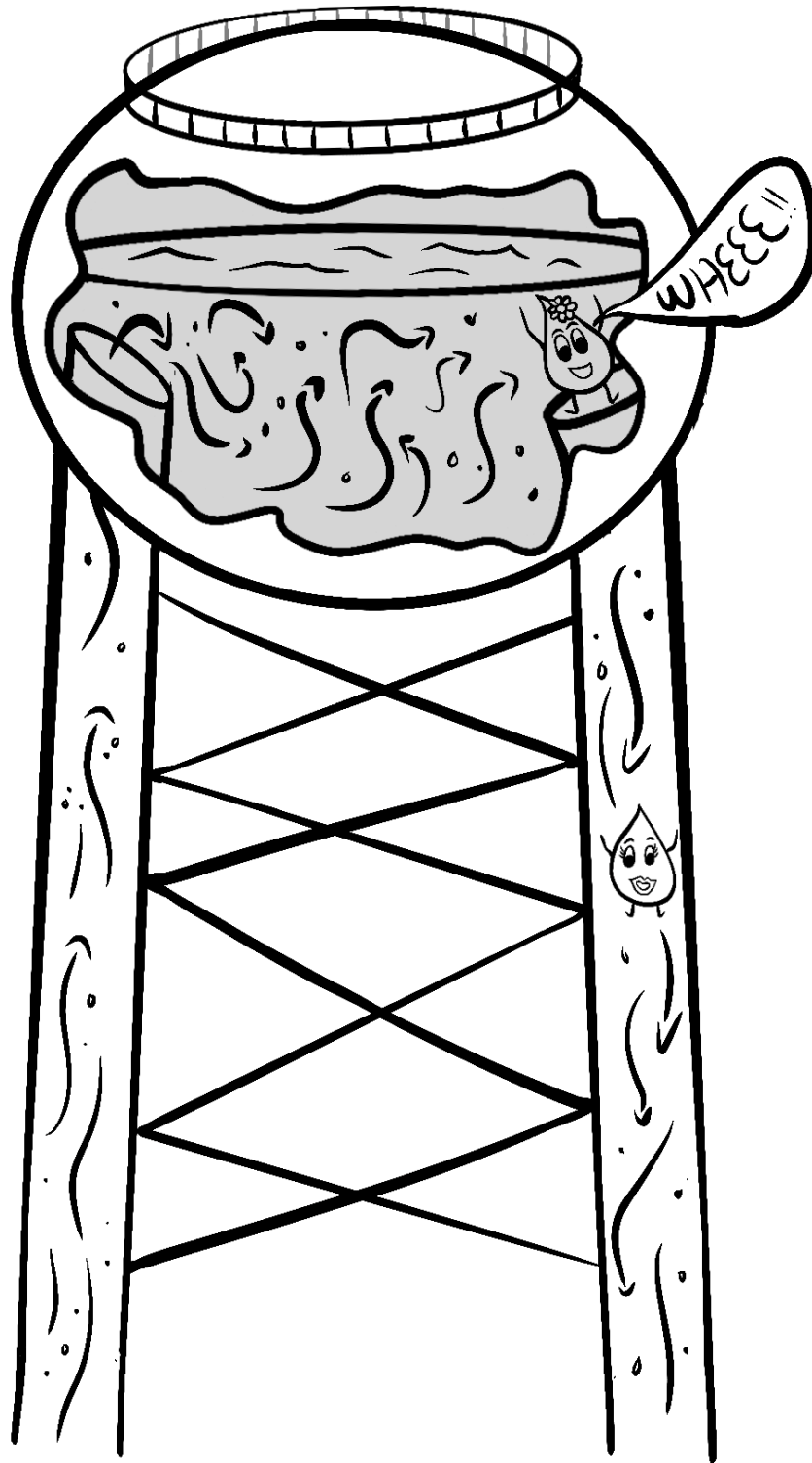


As Dew and Daisy flow through the pipe Dew tells Daisy, “We are on our way to the high service pumps which will help us get to the top of the water tower. It’s really fast, so take my hand.” As soon as they get ahold of each other, they enter the pump and are quickly pushed through. They continue speeding through the pipes and soon realize that they are moving up!

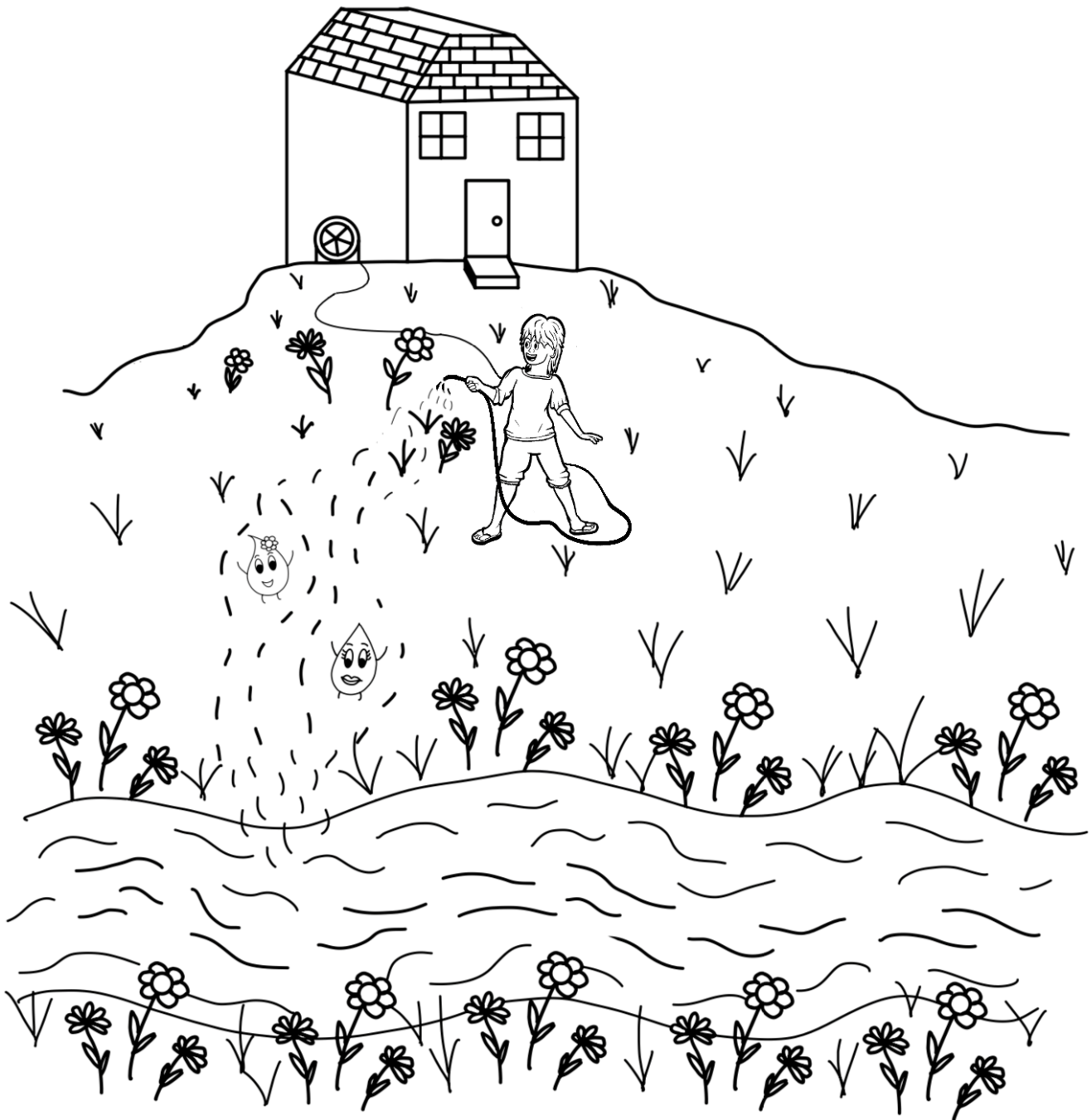
After some time, the droplets suddenly stop moving. Dew explains, “Now we are in the water tower, high above the ground. You may have seen this water tower from the river where we started.”

Daisy replies, "Oh! That's what that metal ball was!"

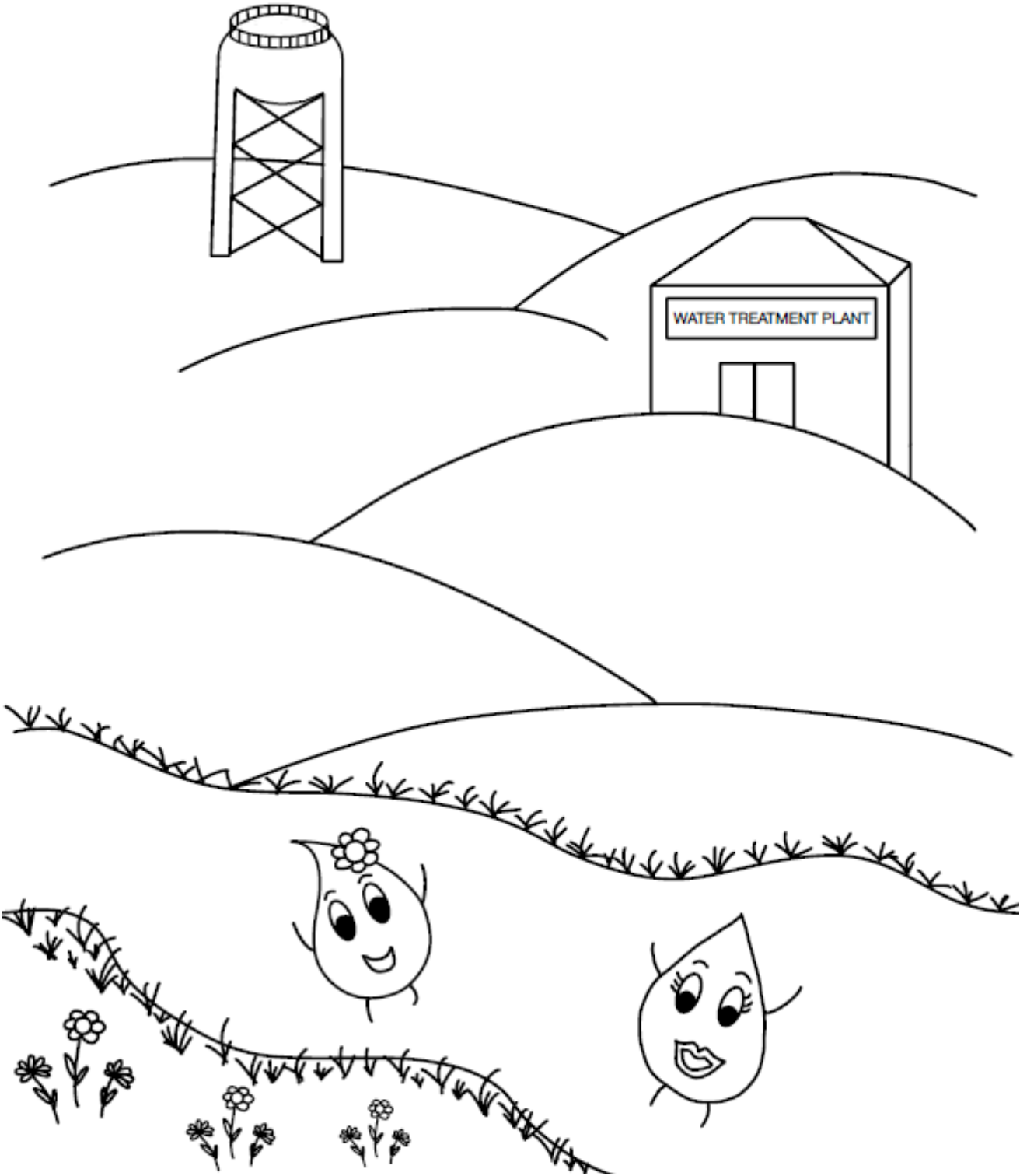
"Exactly!" says Dew. "Hold on tight! Gravity is going to take us all the way to people's homes from here."



They move through a pipe and eventually enter a home. Suddenly, they start hearing a quiet hiss. Dew says, "Oh yay! Sounds like someone is watering their plants!". Together they begin to flow through the pipe to a hose. They come out of the hose spout and into soil they go! They slide through the soil and land in a nearby creek. After some time, the two droplets make it to the end of the creek and are right back in the river where their journey began.



This was the adventure of Daisy and Dew, they had lots of fun, and we hope you did too!



ACTIVITIES

1) Word Search

See if you can find all the hidden words about water treatment!

O	D	P	D	W	F	D	G	C	H	L	O	R	I	N	E	T	A
J	I	Z	W	P	A	L	I	N	S	P	E	C	T	O	R	R	D
S	R	N	Y	F	C	T	O	D	E	W	L	T	T	P	B	E	V
L	O	U	T	C	L	W	E	C	P	B	F	Q	S	E	O	A	E
B	U	A	G	A	L	U	T	R	C	U	B	S	W	R	C	T	N
E	A	L	U	M	K	Y	O	P	X	U	M	Y	L	A	V	M	T
R	D	A	I	S	Y	E	U	R	V	O	L	P	U	T	I	E	U
D	I	S	I	N	F	E	C	T	I	O	N	A	S	O	X	N	R
L	E	C	F	B	A	S	I	N	K	D	U	R	T	R	D	T	E
G	F	I	L	T	R	A	T	I	O	N	E	S	N	I	T	Z	I
S	E	D	I	M	E	N	T	A	T	I	O	N	S	J	O	C	S
Y	R	I	V	E	R	H	C	L	E	A	R	W	E	L	L	N	F

Find the following words are hidden →, ↓, and ↘ in the puzzle.

ADVENTURE
ALUM
BASIN
CHLORINE
CLEARWELL
DAISY
DEW

DISINFECTION
FILTRATION
FLOCCULATION
FLUORIDE
INSPECTOR
INTAKE
OPERATOR

PUMPS
RIVER
SEDIMENTATION
TREATMENT
WATER

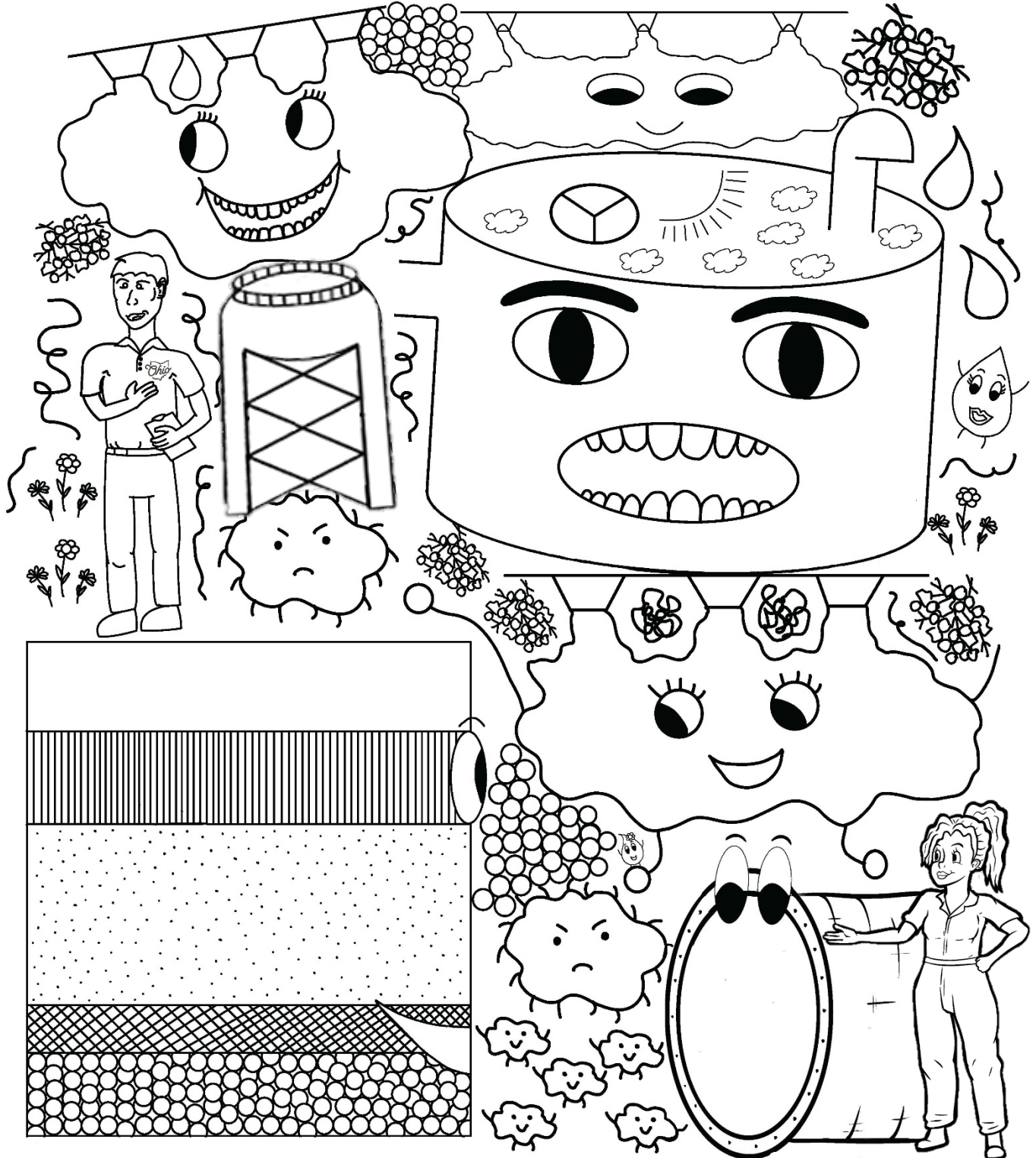
2) Character Word Match

Match the word to its definition!

- | | | |
|--|--------------------------|--|
| Surface Water <input type="checkbox"/> | <input type="checkbox"/> | The chemical used to strengthen teeth. |
| Anthracite <input type="checkbox"/> | <input type="checkbox"/> | A type of Coal |
| Fluoride <input type="checkbox"/> | <input type="checkbox"/> | A chemical used for disinfection. |
| Choline <input type="checkbox"/> | <input type="checkbox"/> | A small dam to slow flow to the filters. |
| Flocculation <input type="checkbox"/> | <input type="checkbox"/> | Holds water to let chlorine clean the water. |
| Operator <input type="checkbox"/> | <input type="checkbox"/> | The process where the yucky stuff sticks to itself. |
| Inspector <input type="checkbox"/> | <input type="checkbox"/> | The chemical that helps create flocs. |
| Intake <input type="checkbox"/> | <input type="checkbox"/> | Flocs and other debris falling to the bottom of the water. |
| Filter <input type="checkbox"/> | <input type="checkbox"/> | In surface water to bring water into the water plant. |
| Clearwell <input type="checkbox"/> | <input type="checkbox"/> | Water above ground (ie. Lakes, rivers or streams) |
| Alum <input type="checkbox"/> | <input type="checkbox"/> | Used to remove yucky stuff. |
| Weir <input type="checkbox"/> | <input type="checkbox"/> | Works for the Ohio Environmental Protection Agency. |
| Flocs <input type="checkbox"/> | <input type="checkbox"/> | Clumps of dirt and debris. |
| Sedimentation <input type="checkbox"/> | <input type="checkbox"/> | Very important person in the water treatment plan. |
| Disinfection <input type="checkbox"/> | <input type="checkbox"/> | The process that kills germs. |

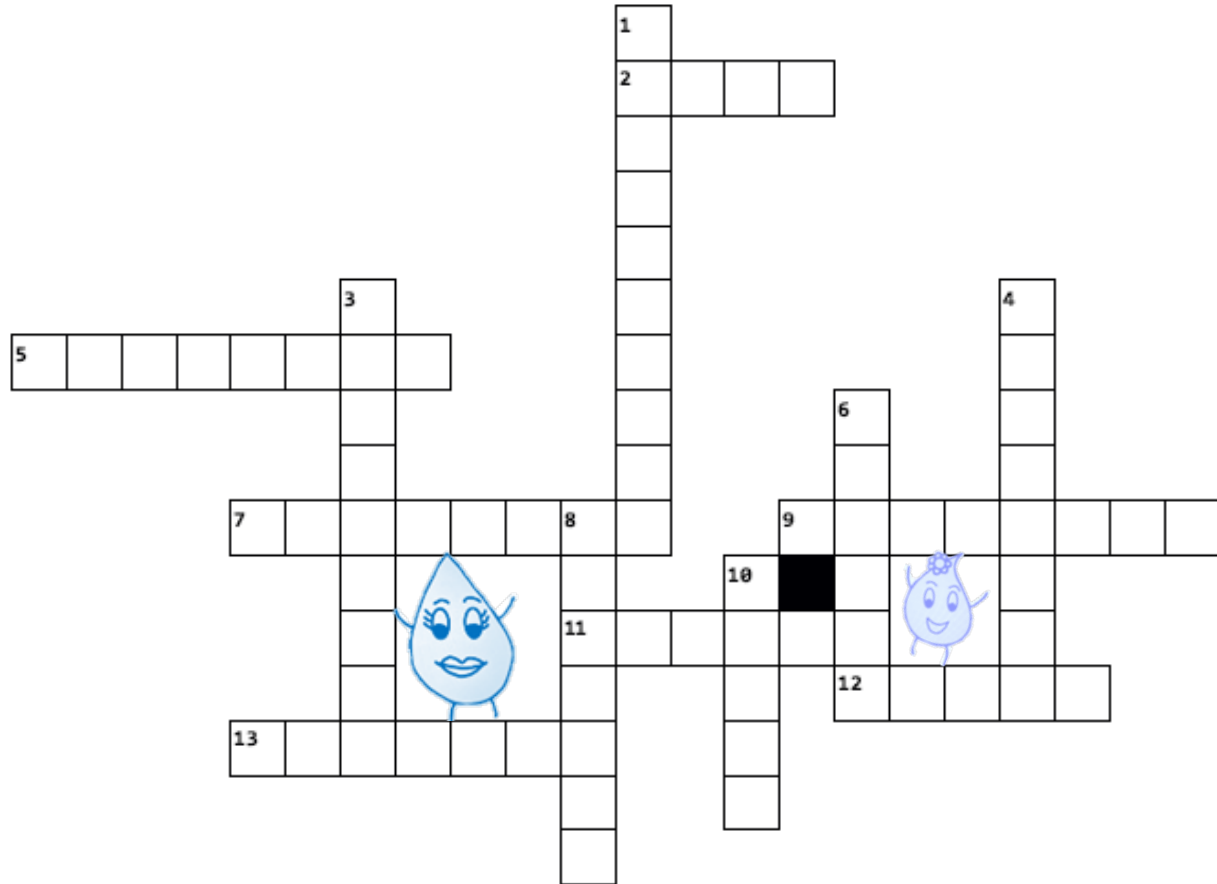
3) Where's Daisy?!

Uh oh! Looks like Daisy got lost in the water treatment plant! Look around the objects and see if you can find her!



4) Crossword Puzzle

Solve the clues to complete the puzzle! Hint: Do not include spaces in your answers.



Across

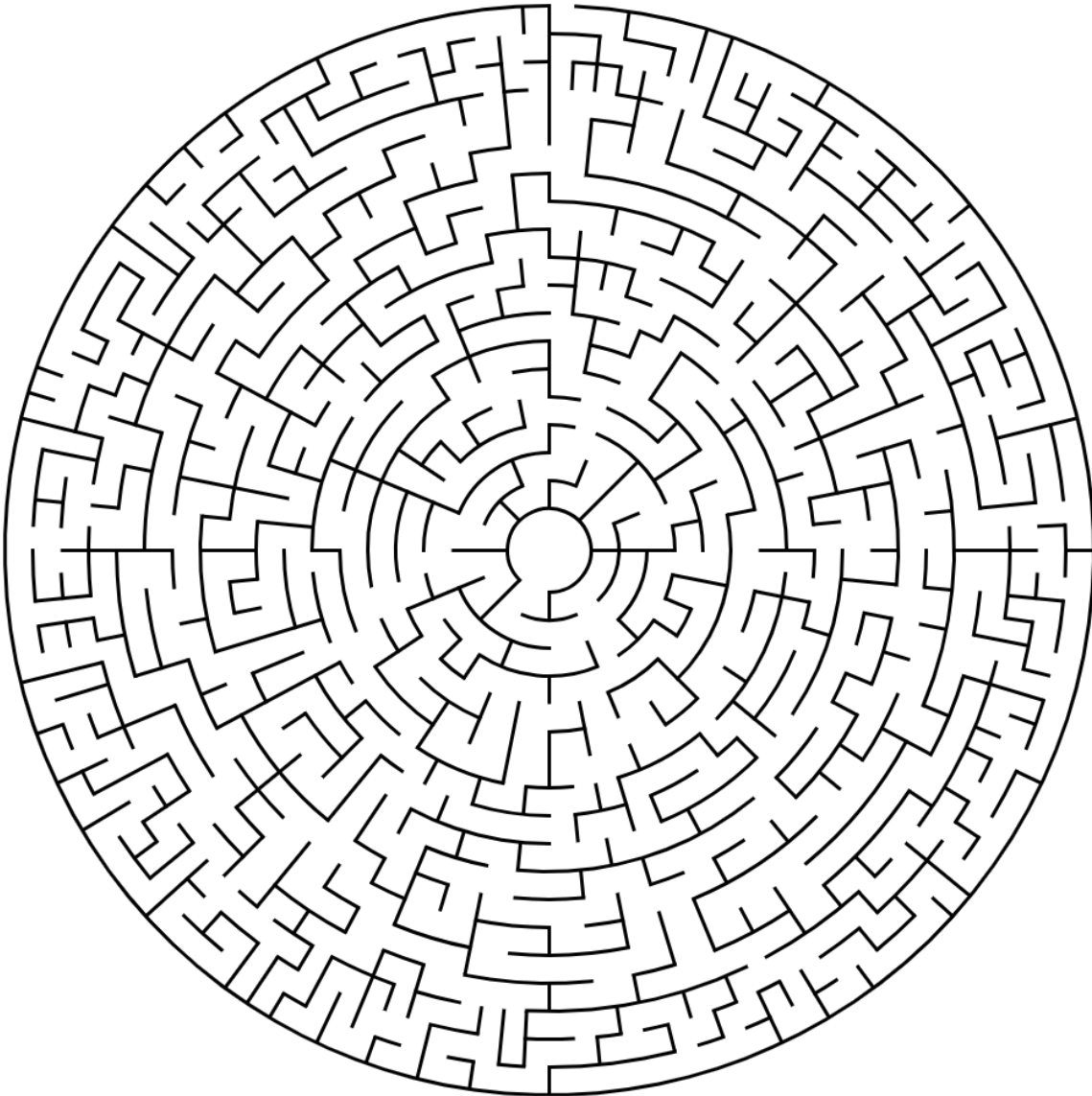
2. The first chemical added in the treatment process.
5. The type of water cleaned at the water treatment plant.
7. The primary person to oversee the water treatment plant.
9. The chemical that helps make your teeth strong.
11. Where Daisy enters the water treatment plant.
12. Body of water where the story begins.
13. Water above ground (rivers, lakes, streams).

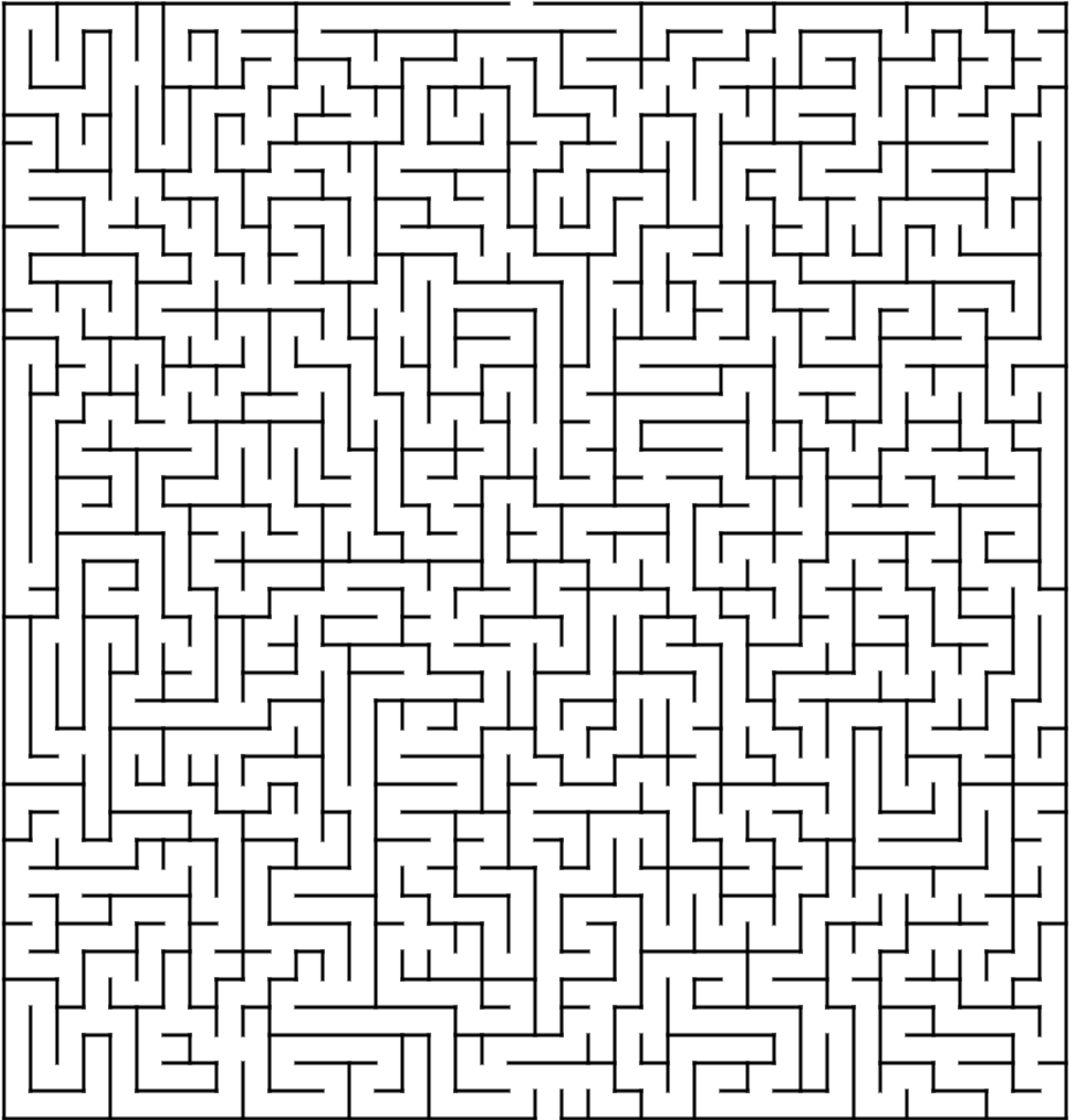
Down

1. Where finished water is stored.
3. Person guides Daisy on her adventure, checks the water treatment plant, and works for Ohio Environmental Protection Agency.
4. The chemical used for disinfection.
6. Fred the _____.
8. Ohio agency that helps protect the environment.
10. Name of main character

5) Mazes

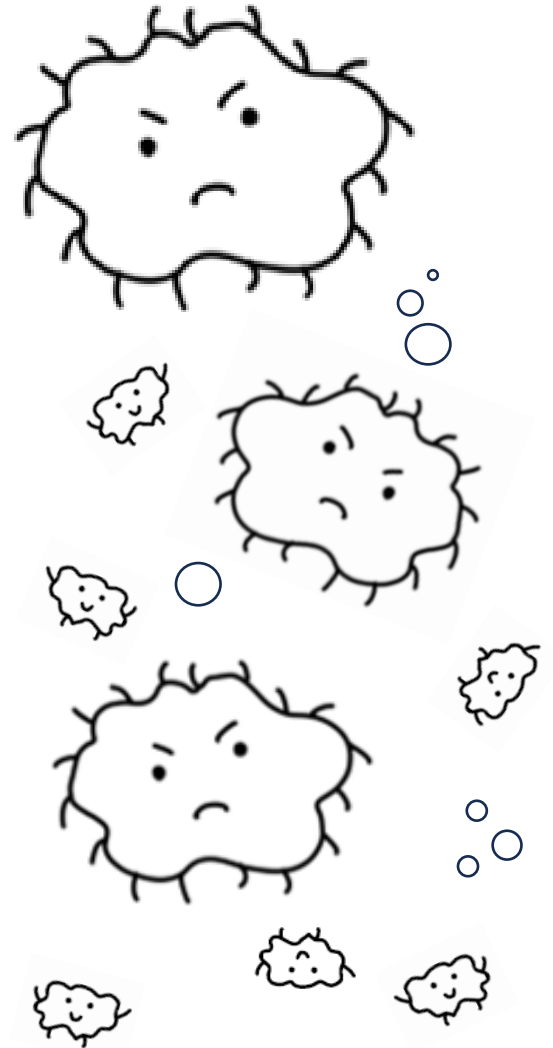
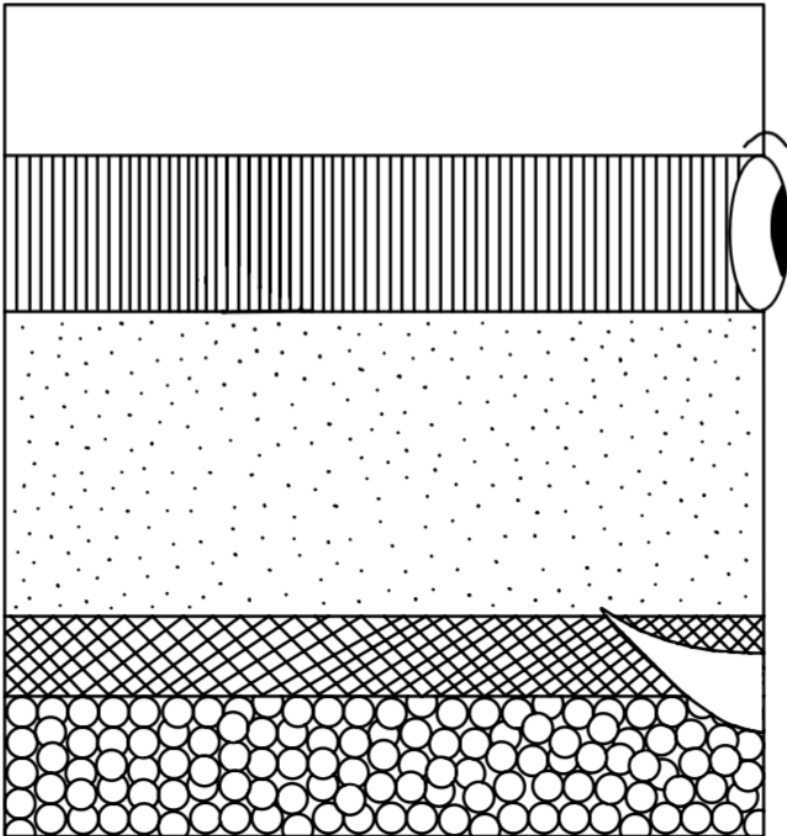
Help Daisy find her way through the mazes! Be careful, there are a lot of dead ends!

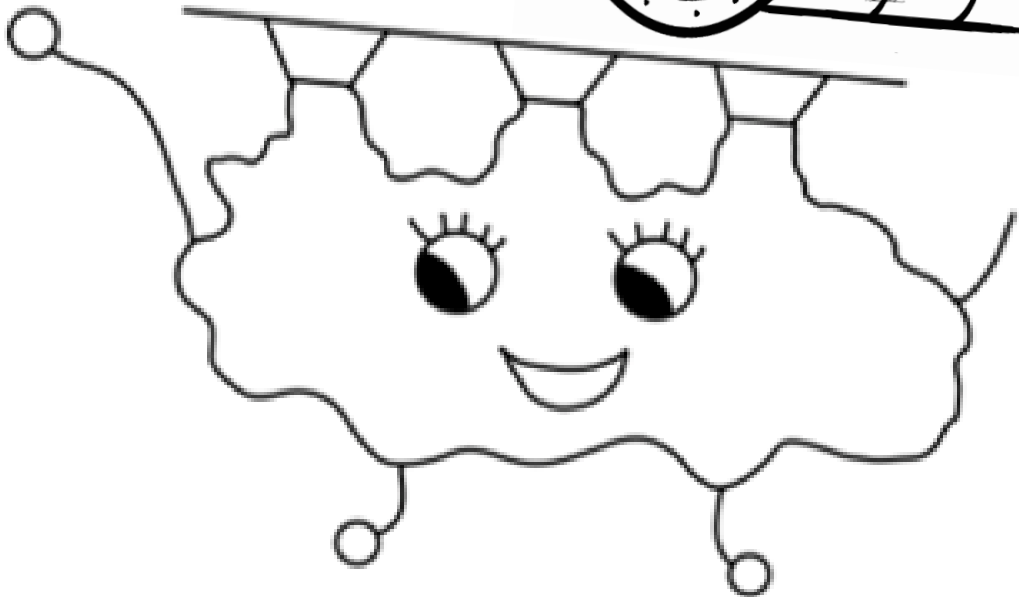
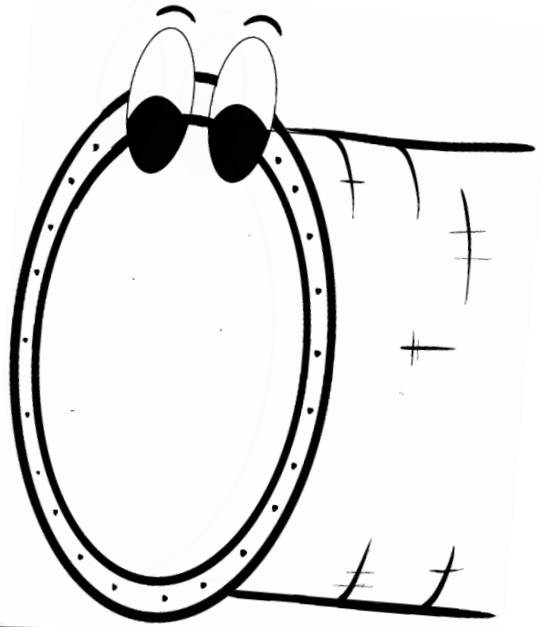
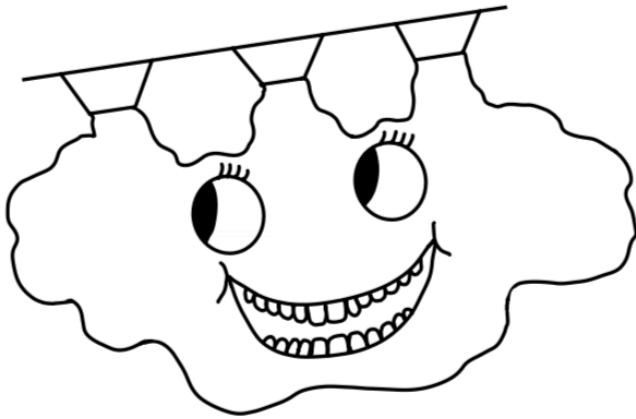
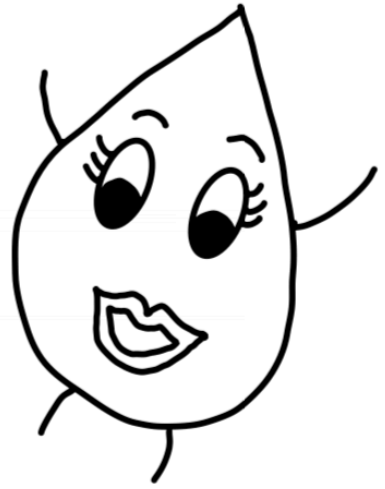
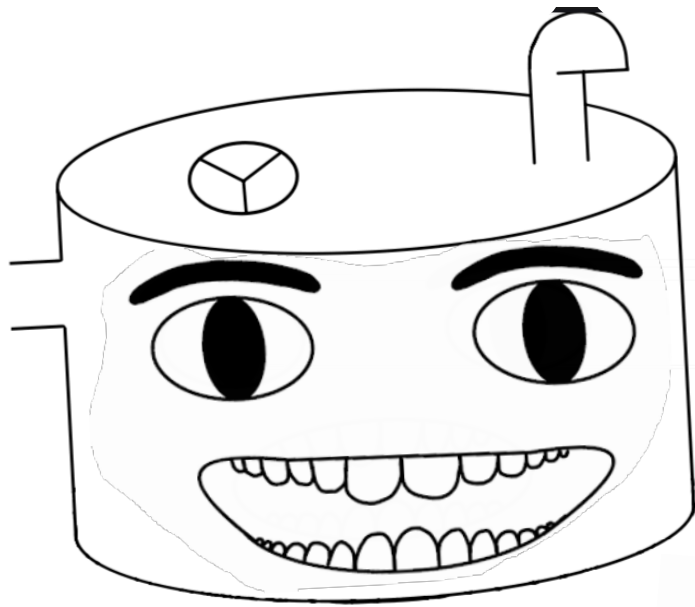


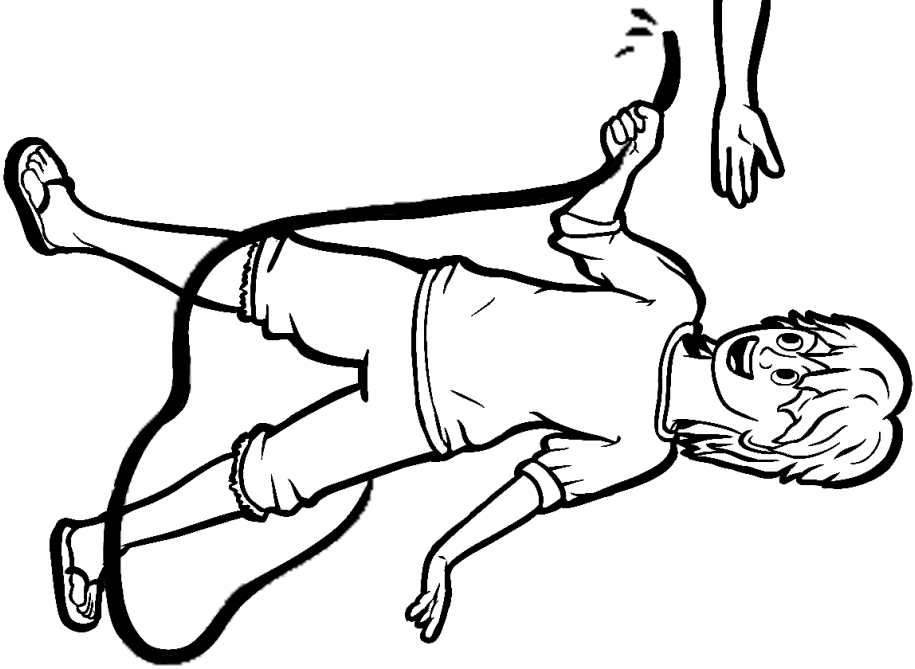
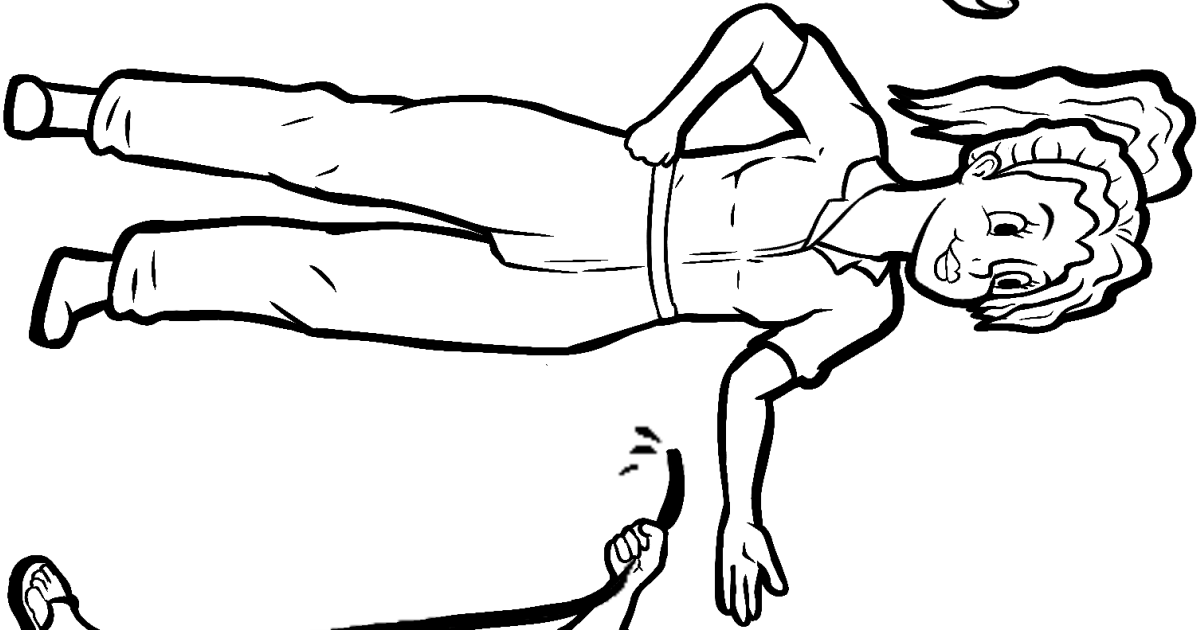
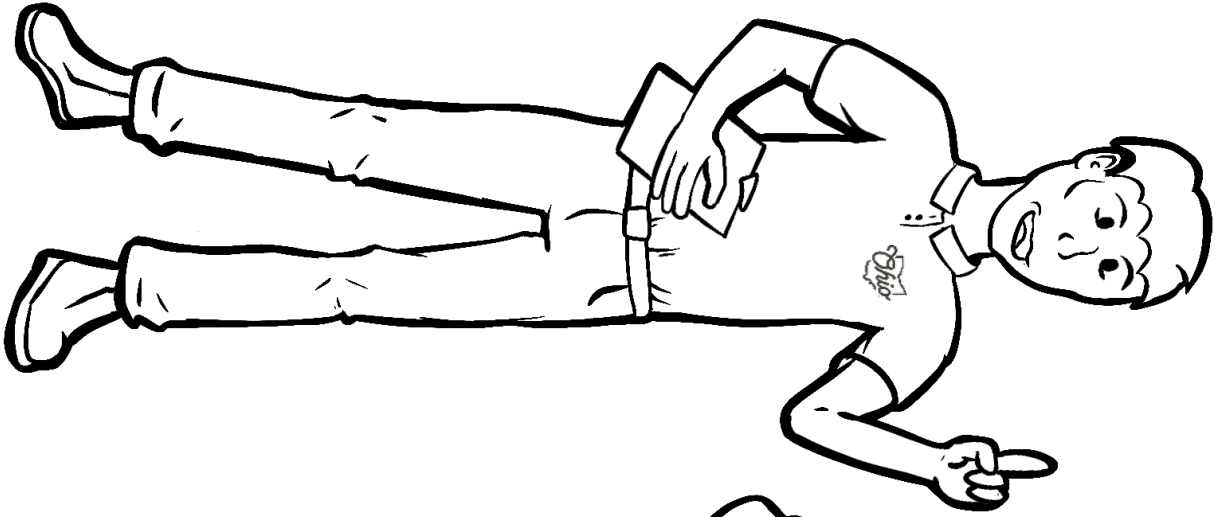


6) Color the Characters

Below are some of the characters from the story. Use your imagination and color them in!

















7) Pipe Matching

Match the dots based on color or the shape inside to complete the pipes. Make sure the whole underground is filled in so Dew and Daisy can find each other!

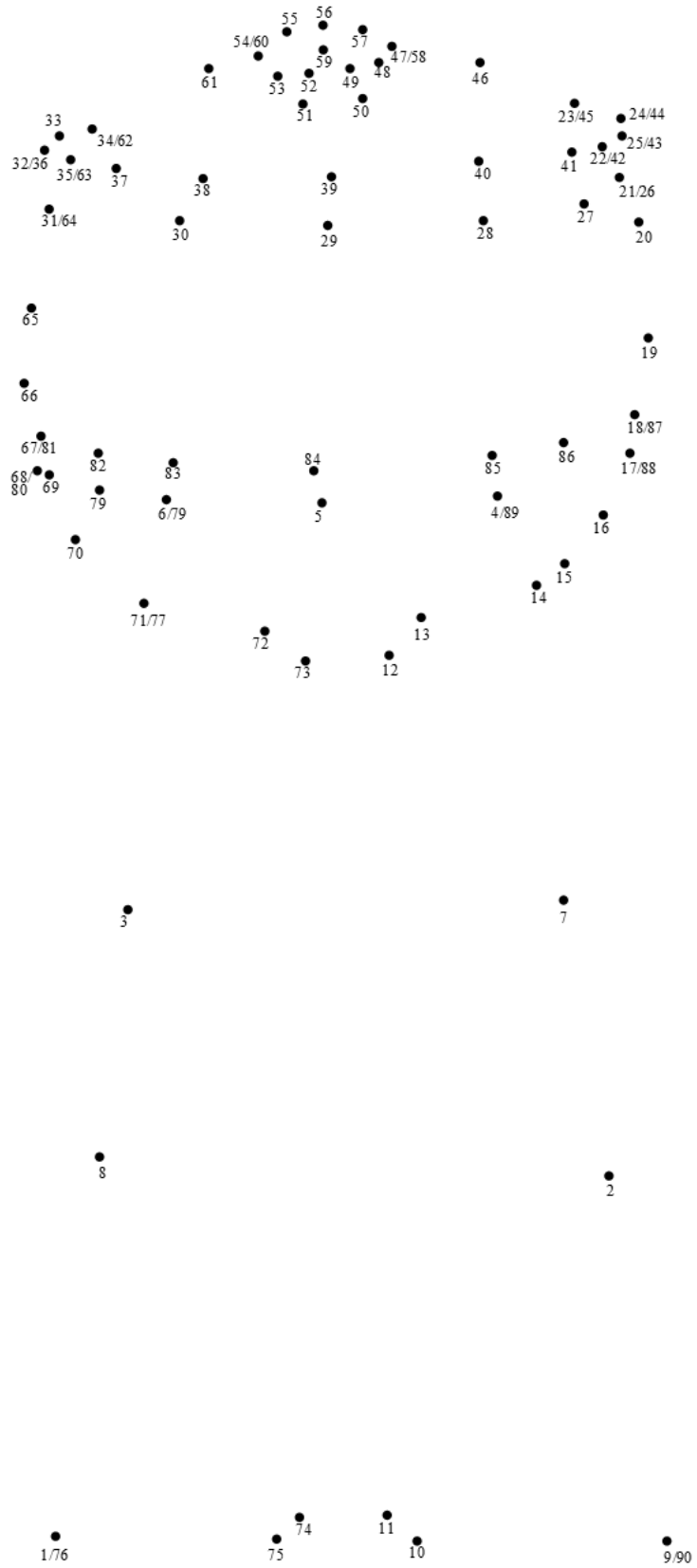


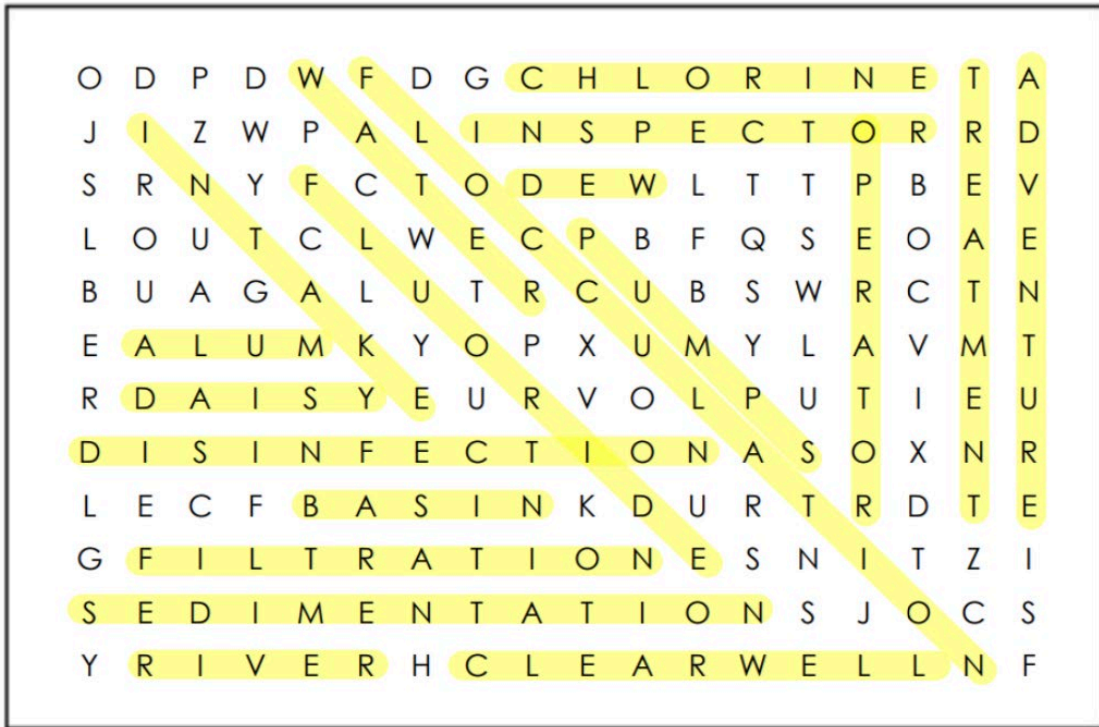


8) Connect the Dots!

Follow the numbered dots to create a picture!

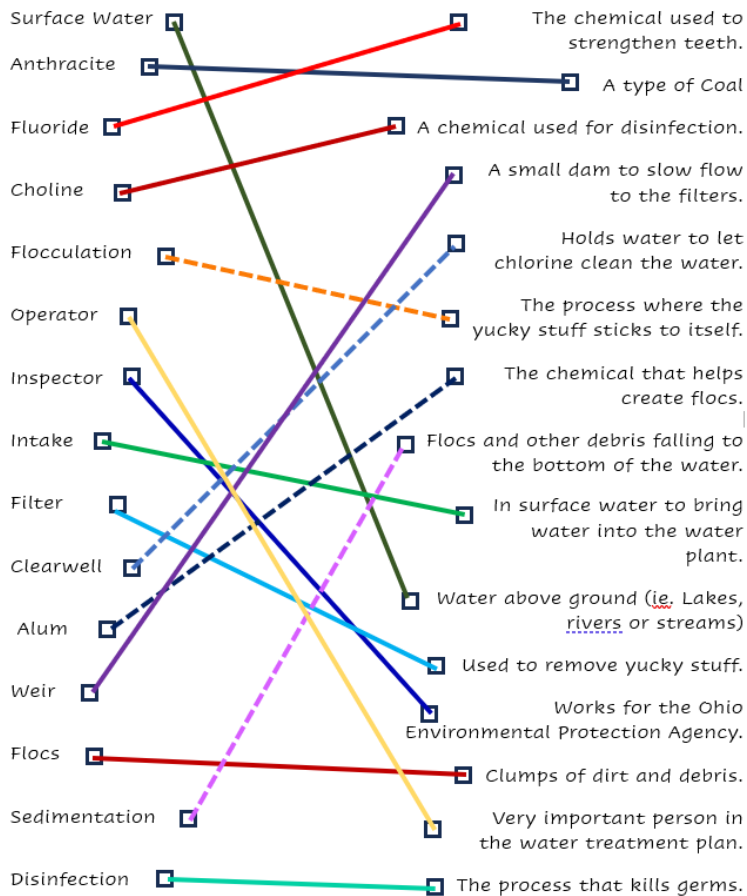


Activity Solutions:



1)

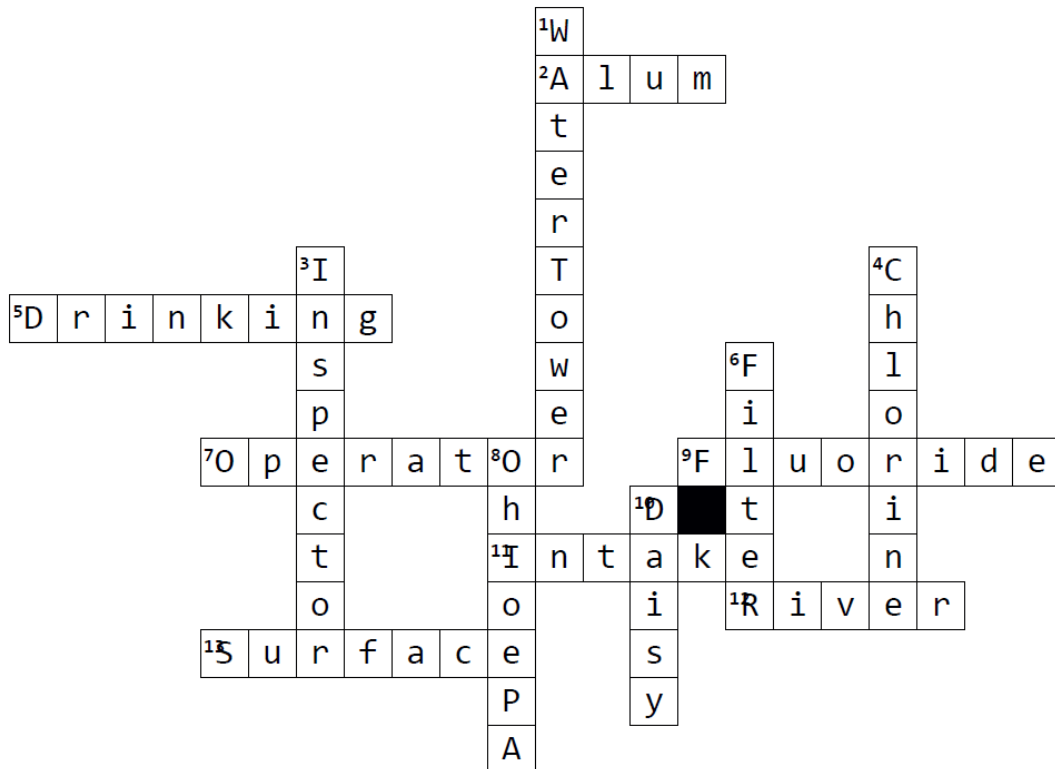
2)



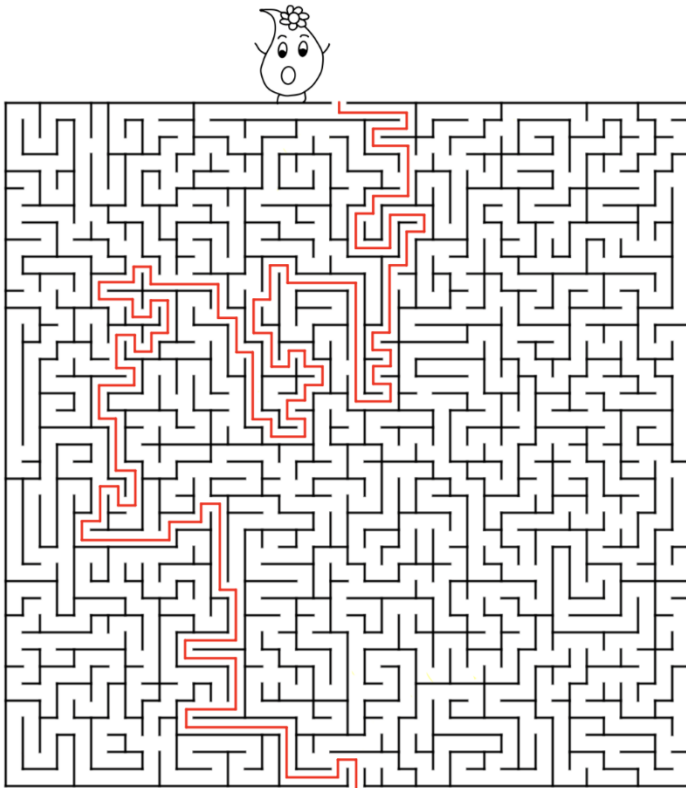
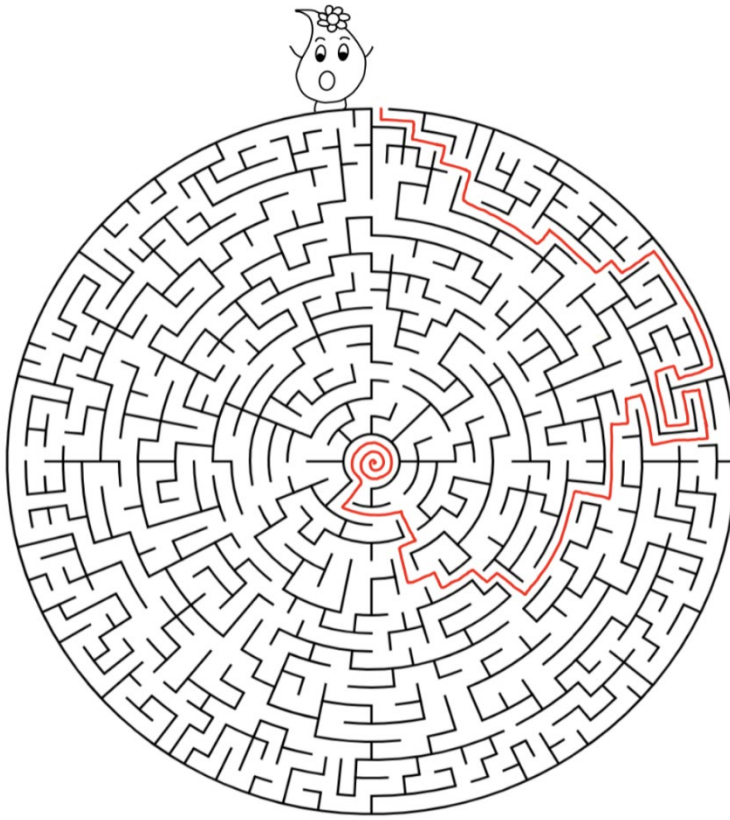
3)



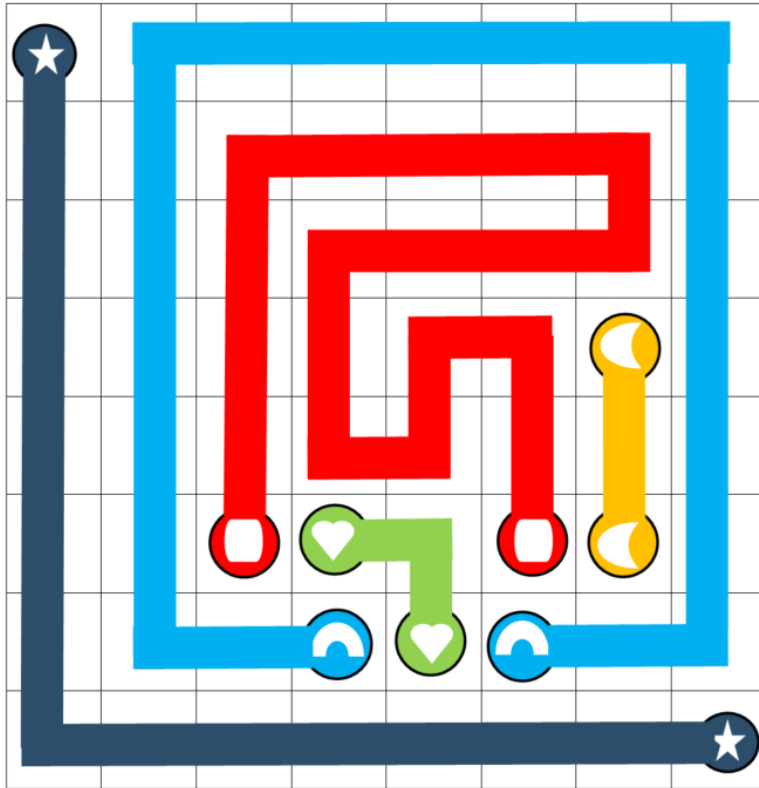
4)



5)



7) Here is one solution, can you find the others?



8)

