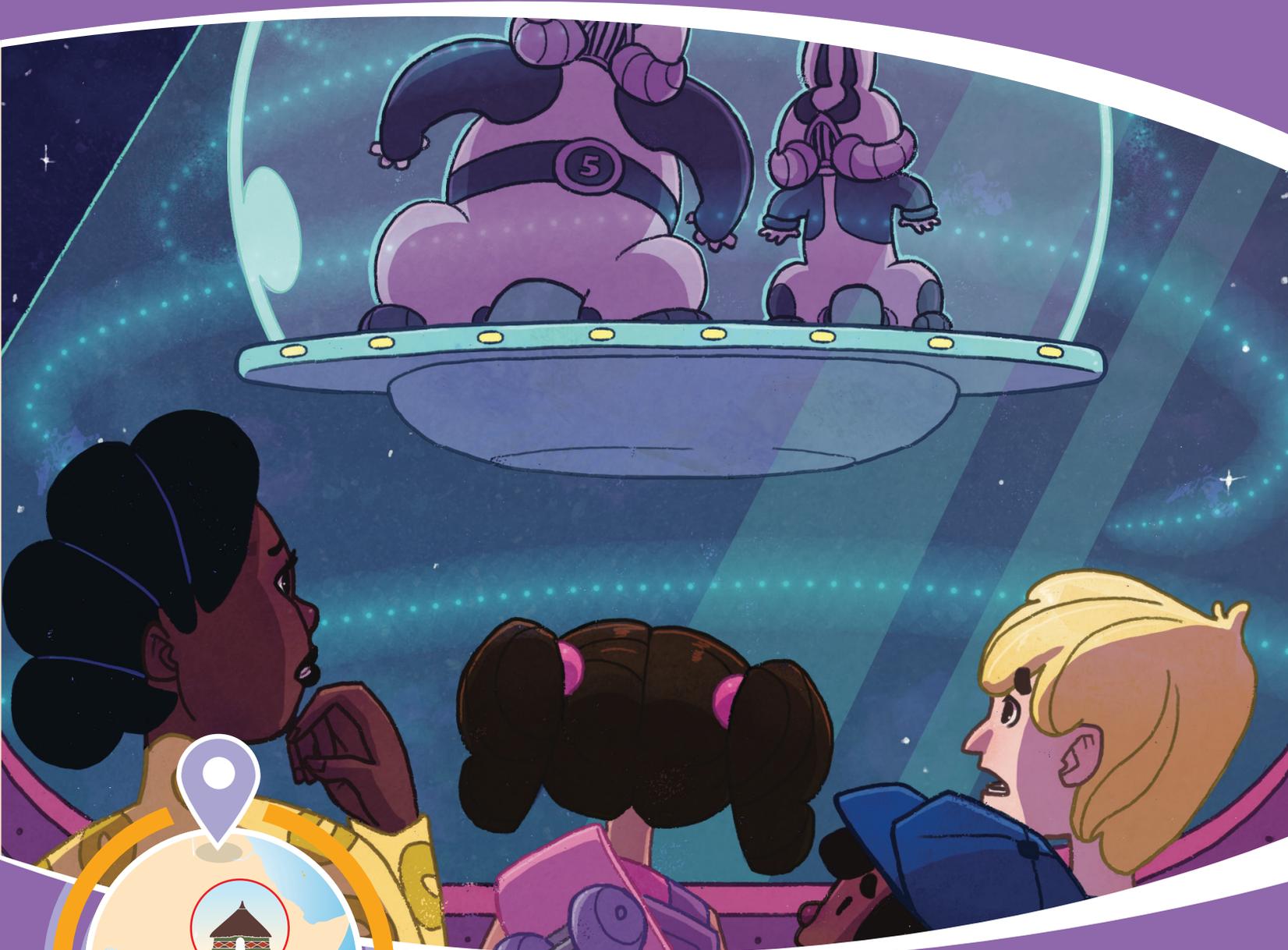


The Respiratory System

Live Lung and Prosper



Buckle in your seat belts because this adventure is on the USS Wangari, your guide is Tenochtitlan Lieutenant Muthoni Kiarie, **and the year is 2216 YIKES!** Rocket to knowledge about the respiratory system in an out-of-this-world adventure.

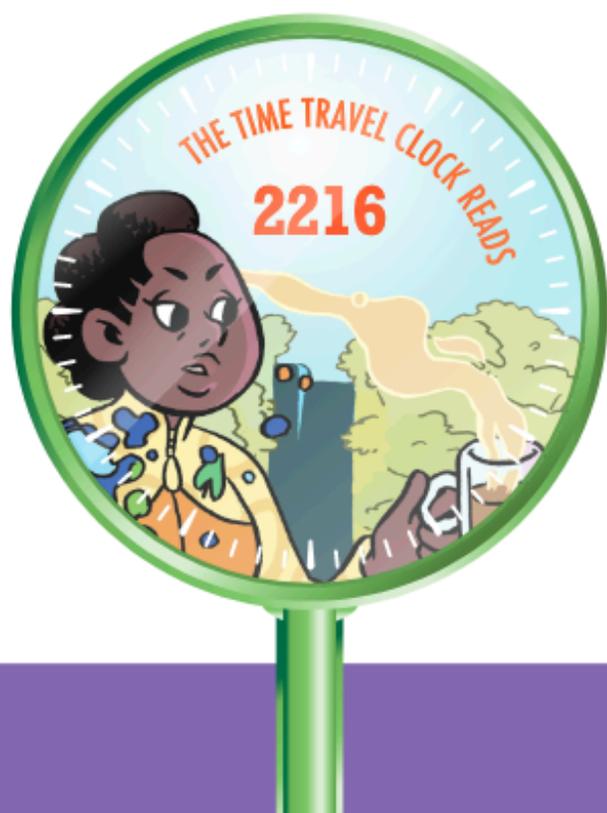
Hello Adventurer!

Welcome to Adventure 9 - The Respiratory System.

In this workbook, you will learn about Kenya and your body's Respiratory System. There will be information to read, activities to complete, and quizzes to take when you are ready to challenge yourself! Take your time along the way - spend as much or as little time as you like on each activity.

Good luck, and have fun!

Can you find
Nairobi, Kenya?



**Get ready to
take a deep breath!**

LEARN ABOUT

The Respiratory System

Inhaling oxygen and exhaling carbon dioxide, the respiratory system keeps us moving.

VISIT

Nairobi, Kenya 2216

The problems of the future are new and unexpected, but the Time Skaters can help us adapt to change!

MEET

Wangari Maathai

The Green Belt Movement fights to protect the world we have and ensure our future.



Jambo!*

That means "Hello" or "How are you?" in Swahili.

***Say it like this: "JAWM-bow"**

The strongest syllable is shown in **CAPITALS** and **red**.

And, a popular response to hello is **poa kichizi kama ndizi!**

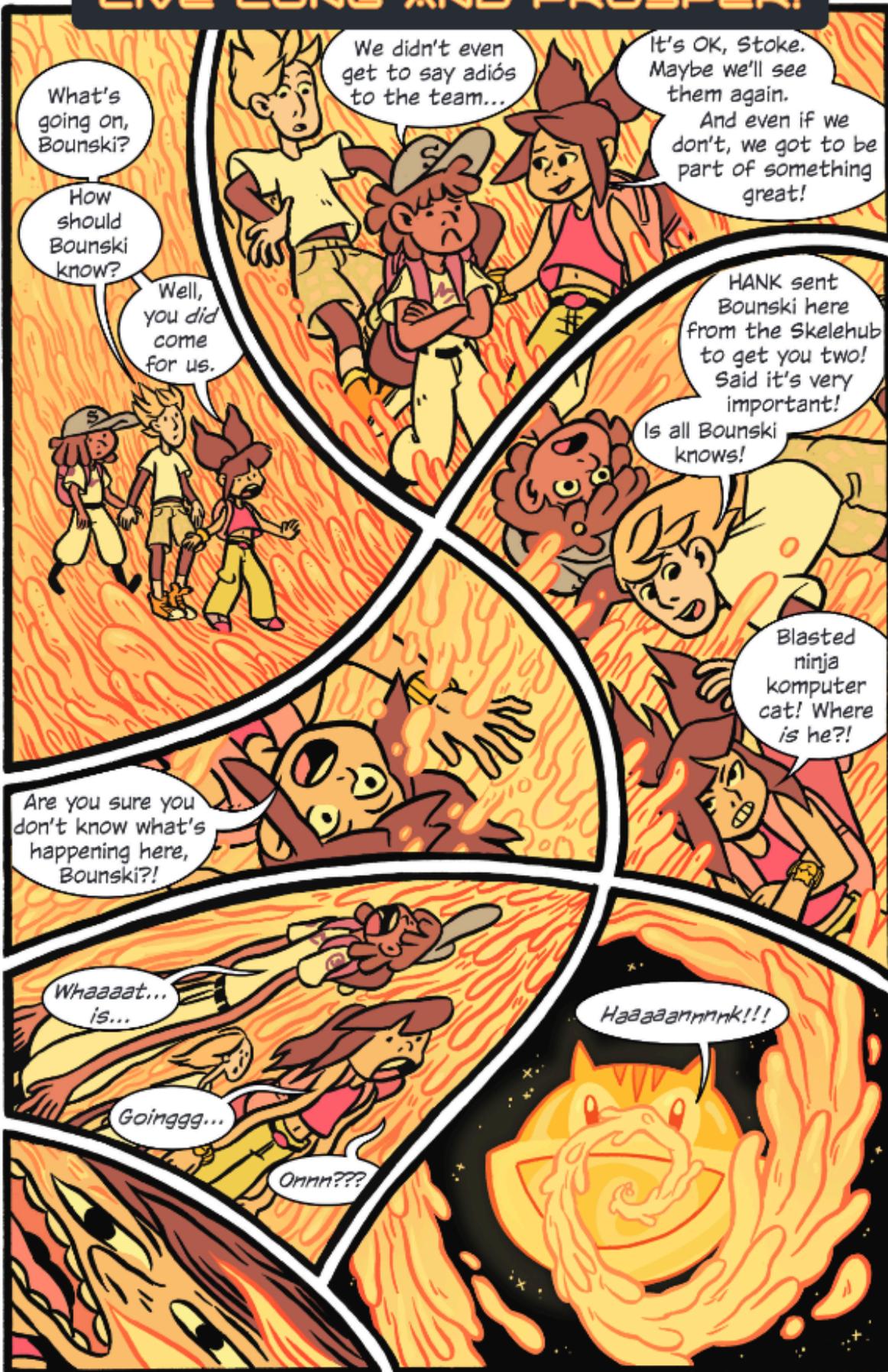
That's Swahili for "crazy cool like a banana."





Time Skaters Adventure 9: Live Lung and Prosper!

LIVE LUNG AND PROSPER!







Stokely?

Pinky?
Bounski?



Hello, arms!
Bounski is happy
to see you
again.

Whoa!
We're in some
kind of tropical
forest!



Where are
you going?

I'm looking for
clues to where
we are...

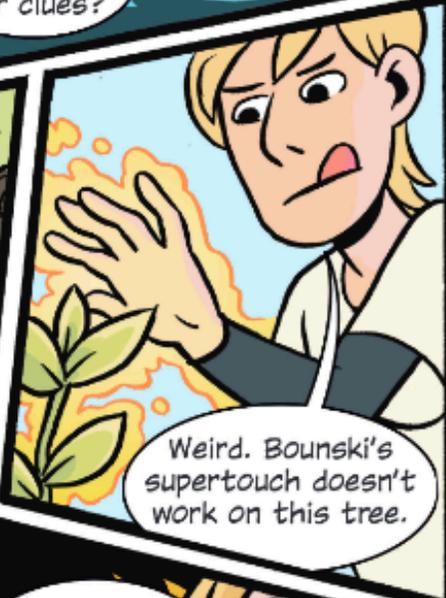
Don't you
mean sniffing
for clues?



A-ber-da-re Park?
We just learned about
this in school. Isn't
that in...Kenya?

Pinky, what
does your
nose tell
you?

I...smell...
coffee?



Weird. Bounski's
supertouch doesn't
work on this tree.



Excuse me,
what are you
doing here?

Learning Calendar

Part **1** **Know Your History**



Locate Kenya on the world map using a globe, an atlas, or an online map (<https://geology.com/world/world-map.shtml>) or check out Google Earth.

Read the comic, **Time Skaters Adventure 9 - Live Lung and Prosper!** Find it at the beginning of this Adventure Guide!

Gather the adventure equipment from around your house - use the checklist on pages 36-37!

Dig into *Know Your History*.

Get to Know *Your Kanga* and **Design** *Your Kanga*.

See *Know Your Harambee* and **Try** *Let's Pull Together*.

Discover *Perpetual Power*.

Answer *Kenya-Even Crossword*.

Note Down *Nairobi Knowledge*.

Part **2** **Know Your Respiratory System**

Dive into *Know Your Respiratory System*.

Be *Th-Air for You*.

Understand *Know Your Lung Capacity* and **Experiment** with *Blow by Blow*.

Know *Your Wind Power* and *Toot Your Own Horn*.

Uncover *Know Your Asthma*.



Explore *Know Your Kenyan Long Distance Runners.*

Piece Together *The Lung and The Short Of It.*

Unravel *the Respiratory Rummage.*

Find *What Be-lungs Here.*

Part **3**
**Know
Your
Appetite**



Master *Know Your Appetite*, shop for ingredients, and get your kitchen ready!

Prepare *Sukuma Wiki and Ugali.*

Share your dishes with your family.

Discuss *Thoughts for Young Chefs* around the table!

Part **4**
**Show What
You Know!**



Finish with *Breathing Exercises.*

Check out *Further Reading* for more opportunities to learn.

**Well done
Adventurer!**

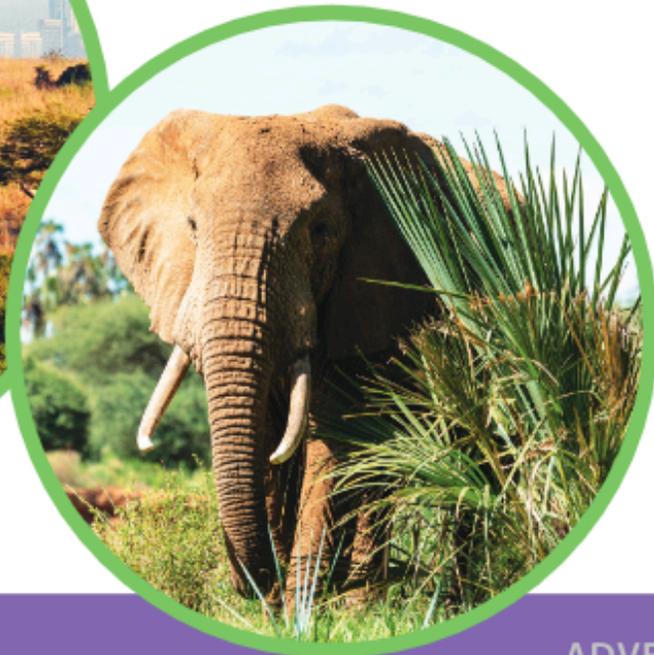
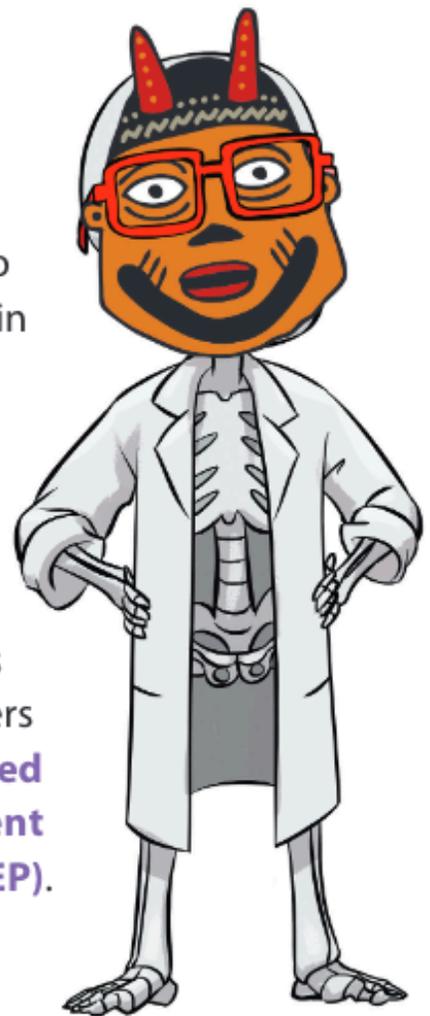


Know Your History

Nairobi

The word Nairobi comes from a Maasai phrase meaning “cool water.” The city sits along the River Athi in the southern part of Kenya and is the only major city to have a wild animal preserve, Nairobi National Park, within its boundaries! From the park, visitors can see the city’s skyscrapers in the background.

Nairobi is Kenya’s most important business and financial center, with countries from around the world doing business there. The United Nations, which works to keep international peace, has its African headquarters in Nairobi, along with the **United Nations Environment Programme (UNEP)**.



Design Your Kanga

Materials:

- Colored pencils, crayons, or markers
- Scratch paper
- Blank piece of paper $\approx 8.5'' \times 11''$
- Ruler

"The kanga struts in style...wear it with a smile!"

-popular African saying



Directions:

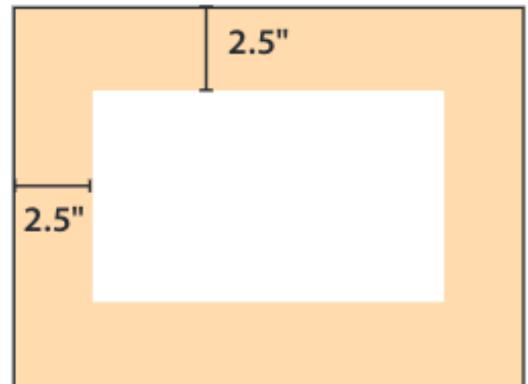
1. Decide on your pindo, miji, and jina.

My pindo will be made of _____.

My miji is a _____.

My jina is _____.

2. Practice drawing your miji on scratch paper and writing your phrase in capital letters.
3. On blank paper, mark 2.5 inches on all sides and fold to create a smaller, inner rectangle.
4. In the inner rectangle, draw your miji. Then, repeat your symbol several times.
5. Using colors that will go well with your miji, draw your pindo.



Strut your kanga! Show it to friends and family. Tell them about the themes and symbols you have chosen and share on social media:

#KnowYourAdventure



KnowYourselfOAK



KnowYourselfOAK

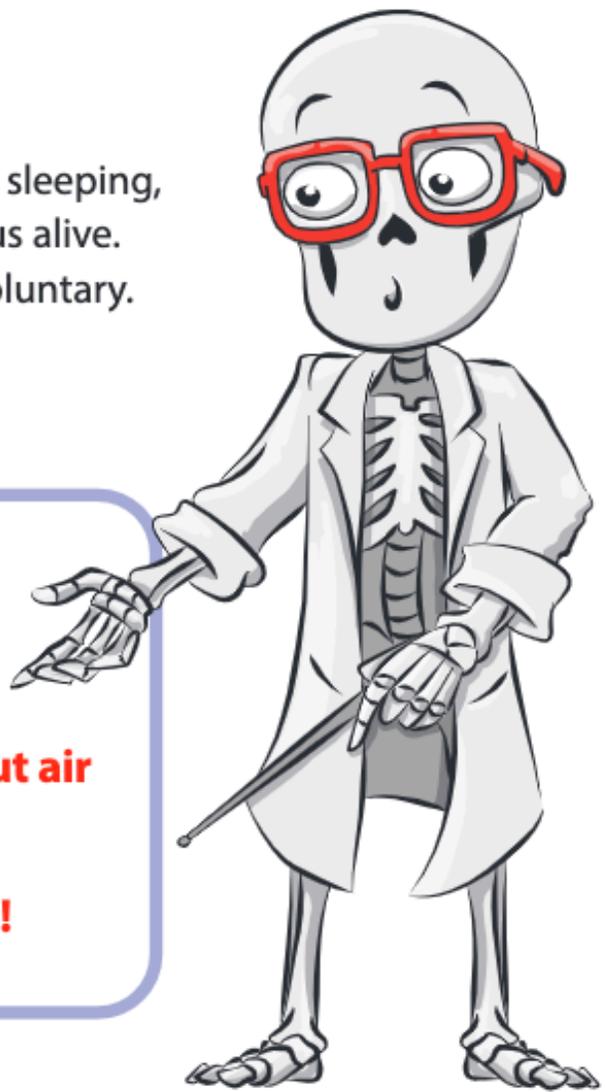
Know Your Respiratory System

Every Breath You Take

Every minute of every day, even when you are sleeping, you are breathing—breathing is what keeps us alive. Just like your heartbeat, your breathing is involuntary. That means you don't have to think about it.

While you could live
3 weeks without food and
3 days without water,
you could only live 3 minutes without air
(often, less than that).

That's how important oxygen is!



We breathe in oxygen with our respiratory system, which is made up of two zones: **conducting** and **respiratory**. The **conducting zone** brings air into your body.

The Five Parts of the Conducting Zone

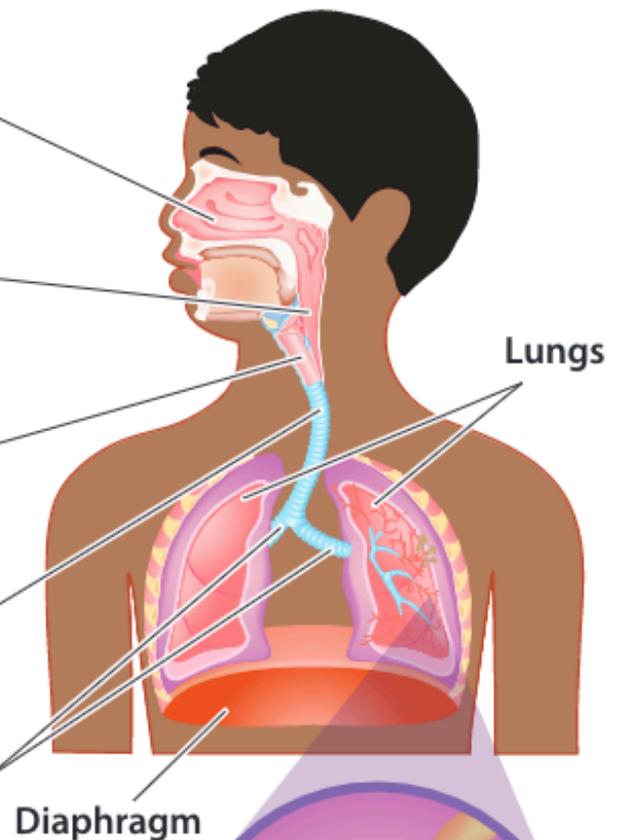
1 **Nose** - takes in air and filters out debris

2 **Pharynx*** - where air is warmed and moistened

3 **Larynx*** - your vocal cords, where you make sounds

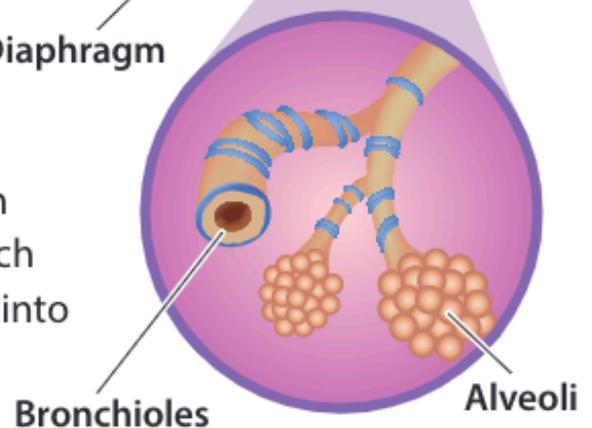
4 **Trachea*** - your windpipe, which helps filter out particles by producing mucus

5 **Bronchi*** - the trachea branches off into two larger tubes



Branching Out

The air travels to what looks like an upside down tree: air first enters the bronchi, one going to each lung. And just like a tree, the bronchi branch off into smaller branches—called “bronchioles.”



*Say them like this:

Pharynx - “**FAIR**-inks”

Trachea - “**TRAY**-kee-uh”

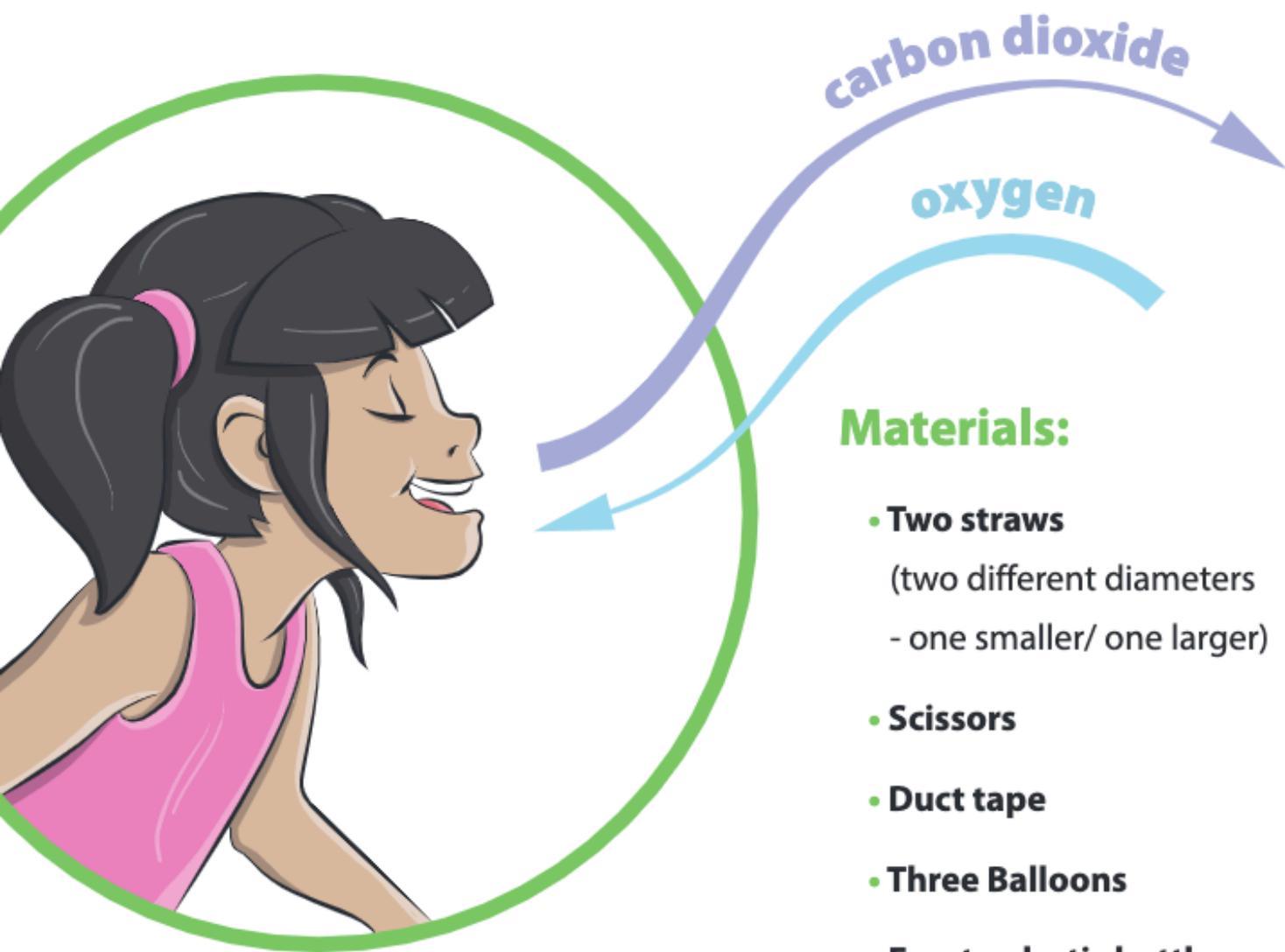
Larynx - “**LAIR**-inks”

Bronchi - “**BRON**-keye”

The strongest syllable is always shown in **CAPITALS** and **red**.

Th-Air for You

Your lungs always try to be *th-air* for you. Every time you breathe through your mouth and nose, your lungs transport **oxygen** inside and **carbon dioxide** outside your body. Watch your lungs at work using the activity materials and directions below.



Materials:

- **Two straws**
(two different diameters - one smaller/ one larger)
- **Scissors**
- **Duct tape**
- **Three Balloons**
- **Empty plastic bottle**
- **A friend**

Directions:

1. **Prepare your model trachea** using two straws with different-sized openings. Use scissors to cut the straw with the smaller opening into two smaller pieces (around 2 inches long).
2. Insert your two smaller straw pieces into the straw with the larger opening to make a Y shape (this will be a little bit of a squeeze!).
3. Now, secure the model trachea. Do this by placing a piece of tape around the outside of the interesting straws - you might need an extra hand to do this.



4. Check on the air supply. Blow through the longest straw in the model trachea to make sure the air is coming out of the two smaller straws at the bottom. Apply more tape if too much air is coming out of the taped area.



5. **Construct the model lungs.** Use scissors to partially cut the openings off each balloon (just the part where you normally blow inside the balloon). Pull each of the balloons over a short straw end. Firmly attach them with tape.



Know Your Appetite

Experience Kenyan Cuisine

Etiquette for Eaters

If you are a dinner guest in Kenya, you will need to follow some rules. Kenyans usually eat with their hands, so before the meal is served, the host will provide each guest with a bowl of water and soap for washing.

In this culture, it's considered unhygienic to eat with your left hand (traditionally, only the left hand is used when going to the bathroom). No matter how squeaky clean one's hands are, it's considered impolite to handle food or utensils with your left hand. You should use only your right hand to eat with. If you are offered silverware, only hold it in your right hand. Do not use your left hand—ever!—not even to touch the bowl!

You have to wait until the meal is over to drink. It is impolite to eat and drink at the same time. Only leave the meal when you are invited to do so.

The ingredients used in most Kenyan meals are fresh, staple foods, and include many different types of greens. Most recipes include meats from cows or goats, while meats like fish, chicken and mutton are used less.



Sukuma Wiki



A common dish is **Sukuma Wiki**. This Swahili word means “stretch the week,” because Sukuma Wiki often lasts for more than one meal. Sukuma Wiki is made with different types of greens, usually collards or kale, and tomatoes. Meat and potatoes are sometimes added too.



Prep time:
10 minutes



Cook time:
30 minutes



Serves 4 people

Ingredients:

- 3 tbsp vegetable oil
- 1 medium sized onion
- 2 pounds kale or collard greens, de-stemmed and finely chopped.
- 2 cups tomatoes, chopped
- 1 cup water
- Salt and pepper to taste

Pinky's Hint:

Read through the entire recipe. This way, you'll know what equipment and ingredients are needed, and you'll be familiar with the steps involved.



Whenever you see the chef's hat icon, it means **you'll need an adult's help.**

Chakula chema!*

That means **"enjoy your meal"** in Swahili.

*Say it like this:

"chaw-koo-la CHEM-aw"

The strongest syllable is always shown in **CAPITALS** and **red**.

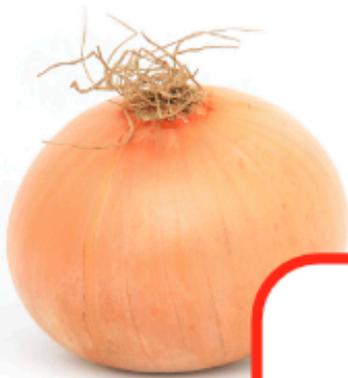
Recipes and food knowledge provided by Chef Polly Legendre of La Gourmande Catering.



Preparation:



1. Heat the oil over a medium-high flame in a large, heavy-bottomed pot. Add the onion, and sauté until translucent.
2. Add the greens in batches, sautéing each addition until wilted.
3. Add the tomatoes, water, salt, and pepper.
4. Bring to a boil, then reduce heat to low and simmer gently until tender, about 20 minutes.
5. Adjust seasoning and serve with a little bit of the broth.



*See next page
for Ugali recipe
to accompany your
Sukuma Wiki!**

*Say it like this:

“sa-coo-ma WEE-kee”

The strongest syllable is always shown in **CAPITALS** and **red**.



**CREATED WITH LOVE
BY THE
KNOW YOURSELF TEAM**

