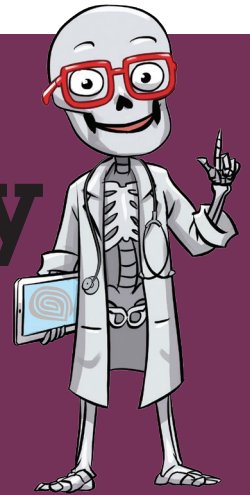


12

The Integumentary System

If I Could Derm Back Time



Run your hands through your hair, and learn about it like you just don't care! **Finish off this adventure where it all started in Oakland, California. The year is 1946** and Shorty Lemonade's great great grandmother is waiting for you to help you learn about the integumentary system.

Hello Adventurer!

Welcome to Adventure 12 - The Integumentary System.

In this workbook, you will learn about the United States in the 1960s, and visit Oakland, California and learn about your body's integumentary 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
**Oakland,
California?**



**Get ready for
a hair-raising adventure!**

LEARN ABOUT

The Integumentary System

Your body's first line of defense is more than meets the eye!

VISIT

U.S.A., 1960s

Tensions rise as the struggle for equality and opportunity continues.

MEET

Kwame Brathwaite and Elombe Brath

The photographers and innovators of the Black is Beautiful movement.



No sweat!*

That means "no problem!"

You might already know this expression, which originated in the 1960s (and has a little bit to do with the body system you are learning).

*Say it like this: "noh **SWET**"

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

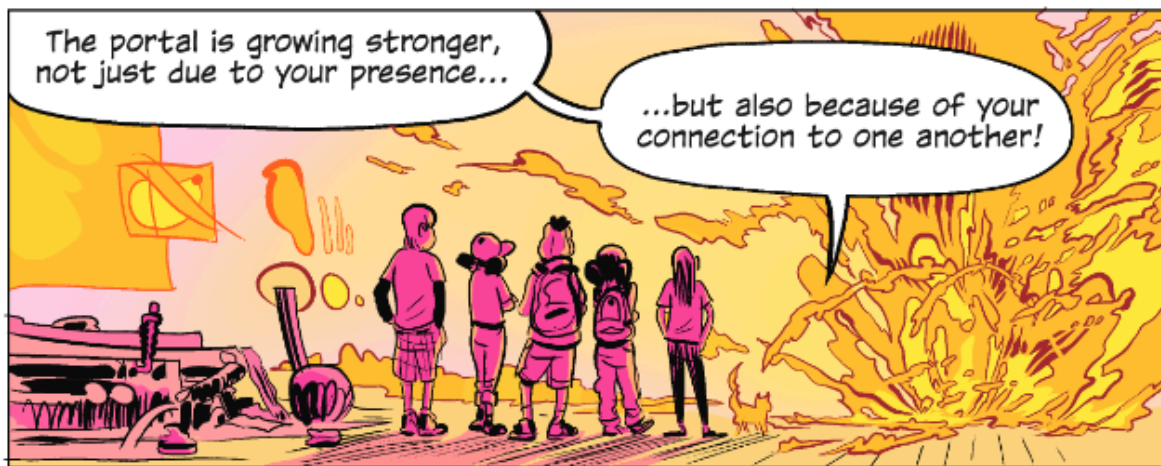


**Don't miss
this last adventure...**



Time Skaters Adventure 12: If I Could Derm Back Time







Learning Calendar

Part **1**

Know Your History



Locate the United States (bonus points for Oakland, CA) on a world map using a globe, an atlas or an online map (like this one: <https://knowyourself.com/maps>).

Read the comic **Time Skaters Adventure 12: If I Could Derm Back Time**.

Gather the adventure equipment you will need on pages 44 through 46.

Travel back to *United States, 1960s*.

Compete with *Contradictory Cubes*.

Nourish your body and mind in *Building Breakfast*.

Comb through *Know Your Hairstyles*.

Brush through *Know Your Art*.

Demonstrate in *Know Your Language*.

Tackle *Operation Oakland*.

Part **2**

Know Your Integumentary System

Get beyond the skin in *Know Your Integumentary System*.

Pore over *Know Your Skin*.

Absorb *Know Your Melanin*.

Get calculating in *Know Your Surface Area*.

Test your limits in *Know Your Sensitivity*.



Become an integumentary detective in *Know Your Fingerprints*.

Take a closer look at *Mole Patrol* and *Acne Acumen*.

Unravel a *Strand at Hand*.

Overcome the *Integumentary Investigation*.

Surge through *Systems Security*.

Part **3**
Know Your Appetite



Build up your hunger with *Know Your Appetite*.

Read the recipes on the following pages. Make a shopping list, purchase ingredients, and get your kitchen ready!

Prepare *Hoppin' John* and *Lemon Sour Cream Pound Cake*.

Share your dishes with your family.

Discuss *Thoughts for Young Chefs* around the table!

Part **4**
Show What You Know!



Impress with *Positively Powerful*.

Explore more with *Further Reading*.



Know Your History

United States, 1960s

The 1960s was a decade of change in all aspects of life from music, attitudes, and society as a whole. Many were fighting for themselves and others to gain equal rights.



The Civil Rights Movement

The **Civil Rights Movement** was one example of the fight for equal rights for Black Americans. While the Civil War abolished slavery, it did not end **discrimination*** against Black people. Instead, they continued to be treated poorly, particularly in southern states.


*Say it like this:

discrimination - “**dis-crim-eh-NATION**”

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

For a long time in the United States, laws kept people **segregated*** based on race. Even though the law said that everyone should get equal treatment, some states and cities decided that they could give people different treatment if they claimed the treatment was equal.

For example, if people from both groups had a school to attend, that counted as equal - even if one school was much nicer than the other. Many people could see that these **"separate but equal"** rules were not actually fair, but it was not until 1954 that the Supreme Court said they were illegal.



Even after that, fighting against segregation lasted decades, and in some places is still going on today.

***Segregation**

The separation or isolation of a race, class, or ethnic group by restrictions on where they live, by separate educational facilities, or by other discriminatory means.

Contradictory Cubes



Materials:

- **Two six-sided dice**
- **The Contradictory Cubes Game** (page 55)
- **Two game pieces** (coins, rocks, or anything you want to use)
- **Two players**

Directions:

1. Place both game pieces on the start square.
2. Player 1 rolls one die and moves ahead the number of spaces the die says.
3. Player 2 rolls both dice, then picks one. They move the number of spaces the picked die says.
4. If you land on a space from your roll, do what it says on that space.
5. The first player to get to the End square wins the game.



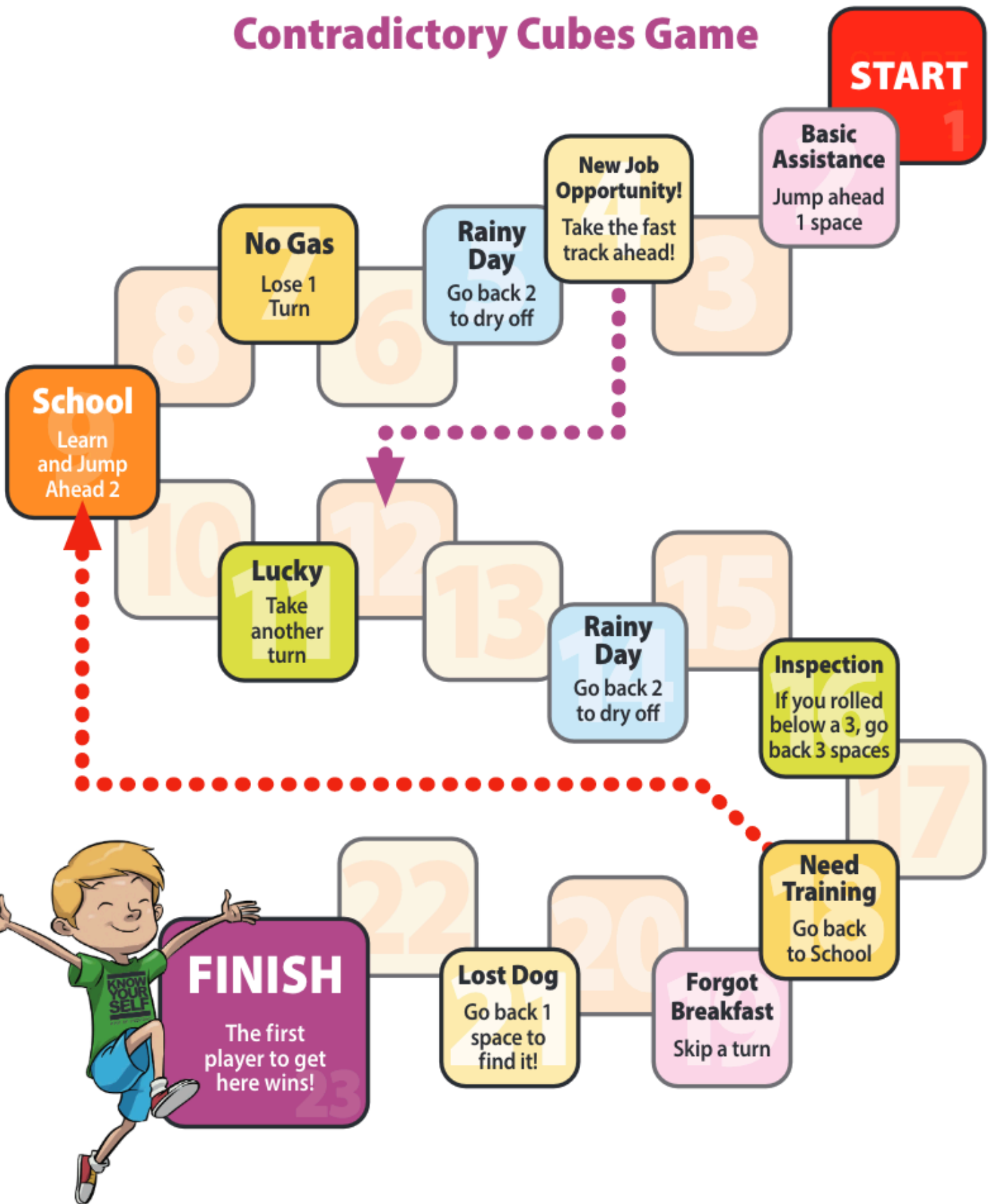
Directions:

- 6. Switch which person is player 1 and which is Player 2, and play again.
- 7. Talk about your experience playing the game afterwards.
 - a. What made the game seem fair?

- b. What made it unfair?

- c. How did it feel to be player 1, and how did it feel to be player 2?

Contradictory Cubes Game



Know Your Integumentary System

Defense Mechanism

You have systems inside your body, but did you know that you're covered in a body system?

Your hair, skin, and nails make up the **integumentary system**.



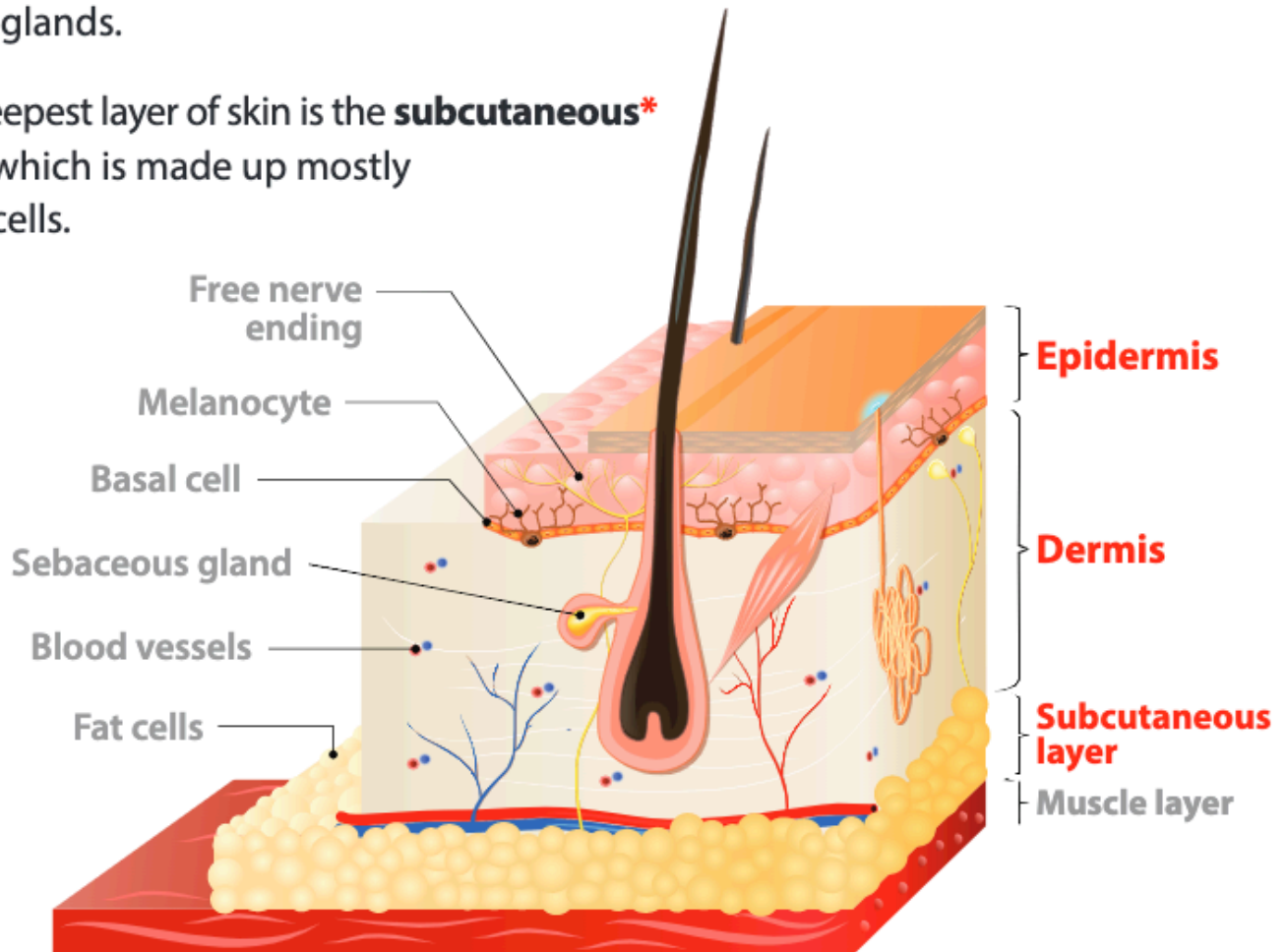
Skin is your body's largest organ. But it isn't just what you see on the outside. Skin is a complex organ made up of three main layers. The layer you see is called the **epidermis**. The epidermis has many layers of cells, but is only as thick as a sheet of paper over most of your body. It is thicker on areas you use more, like the palms of your hands and the soles of your feet. The cells of the epidermis contain keratin, a protein that helps protect skin from damage.

CELL-BY DATE: Cells in the epidermis are replaced every two to four weeks. Nails are replaced every six months. Hair on your head is replaced every two to seven years.



The **dermis** lies beneath the epidermis. It is thicker than the epidermis and contains two main proteins, **collagen*** and **elastin,*** which make skin flexible and help support the epidermis. The dermis contains many smaller structures, including blood vessels, nerve cells, hair follicles, muscle fibers, oil glands, and sweat glands.

The deepest layer of skin is the **subcutaneous*** layer, which is made up mostly of fat cells.



*Say them like this:

collagen - "CALL-uh-jin"

elastin - "ih-LAS-tin"

subcutaneous - "sub-cue-TAY-nee-us"

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

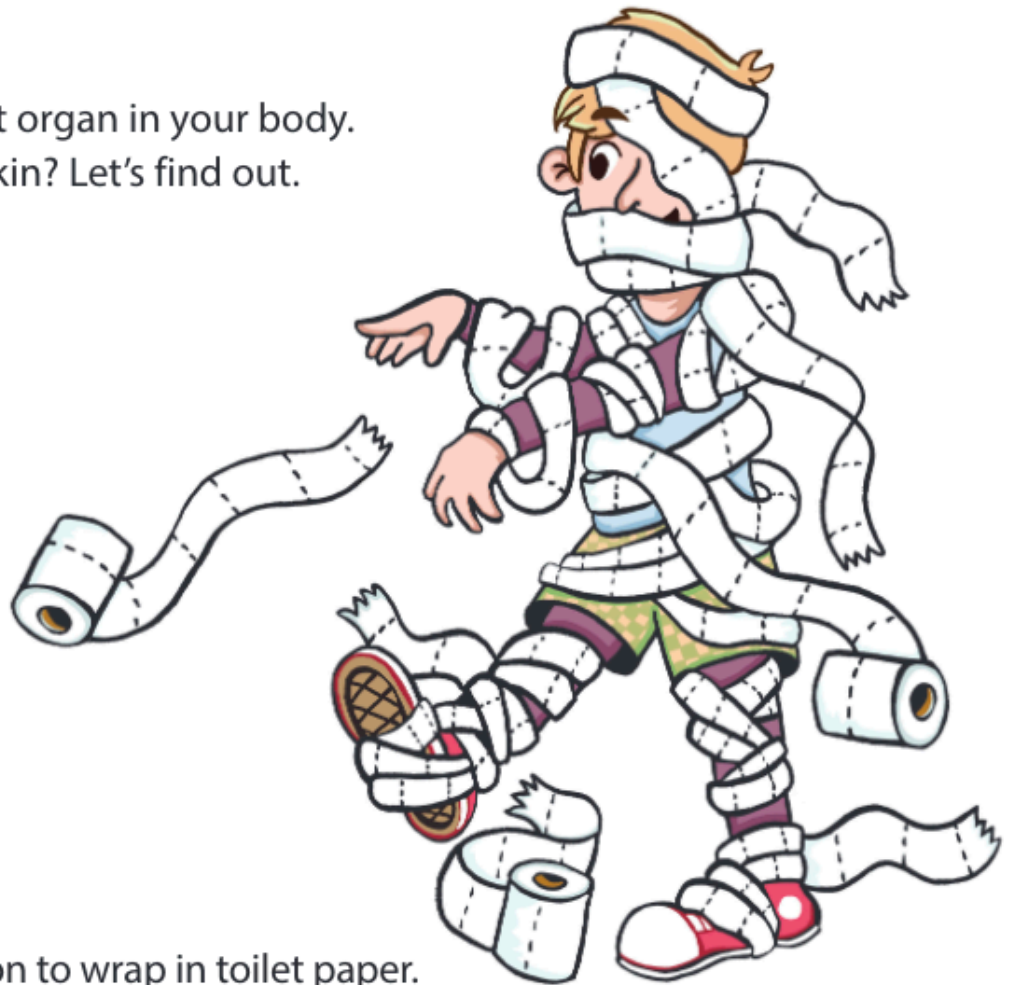
Know Your Surface Area

I'll Cover You

Your skin is the largest organ in your body. Just how big is your skin? Let's find out.

Materials:

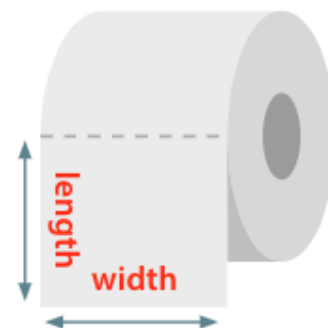
- Toilet paper
- Metric ruler
- A partner



Directions:

1. Choose one person to wrap in toilet paper.
2. Gently wrap the person in toilet paper until they are completely covered — head, hands, and feet, too! Try not to let the toilet paper overlap too much. If the toilet paper tears, dispose of any partial squares. Then, start another strip with a new square.
3. Carefully remove all of the toilet paper. If you tear a square, keep all the pieces together. Lay the toilet paper flat on the floor or a table.

4. Count the number of toilet paper squares. Use a metric ruler to measure the length and width of a square in centimeters.



Complete the following chart to calculate the surface area of skin:

Calculate surface area of 1 toilet paper square

$$\text{length } \boxed{\text{cm}} \times \text{width } \boxed{\text{cm}} = \text{area of 1 square } \boxed{\text{cm}^2}$$

Calculate total surface area

$$\text{area of } \boxed{\text{cm}^2} \times \boxed{\text{number}} \text{ of squares} = \text{total surface area } \boxed{\text{cm}^2}$$

Convert to square meters

$$\text{total surface area } \boxed{\text{cm}^2} \div 10,000 = \text{total surface area } \boxed{\text{m}^2}$$

The surface area you just calculated is an estimate. How close do you think your calculation is to the actual measurement? Do you think it is larger or smaller than the actual surface area? Explain.

How big is skin? The average adult human has about 2 m² (21.5 ft²) of skin. Adult skin weighs 3.6 to 4.0 kg (8 to 9 lb).



Know Your Appetite

Southern Comfort

Many Southern cuisines were developed by Black cooks and chefs in the kitchens of the Southern United States. Reaching from Virginia to Florida to Texas, “the South” often includes Louisiana through both North and South Carolina. These regions had a variety of influences, growing a food culture with elements from Native Americans and people from Europe and West and Central Africa.

One famous dish from the Low country region of South Carolina is Hoppin’ John, a mixture of black-eyed peas and other vegetables served with rice. Its name possibly came from the Haitian Creole, **pois à pigeon**,* heard as “Hoppin’ John.”

Served with collard greens and cornbread, it’s eaten on New Year’s Day to ensure a prosperous year ahead.

Buttery pound cake is a beloved dessert, named after its original, easy-to-remember recipe: one pound each of butter, sugar, eggs, and flour.



Hoppin' John



Makes 2-4 servings



**Prep time:
20 minutes**



**Cook time:
30 minutes**



Ingredients:

- 4 cloves garlic
- 1 small bunch green onions or 1 medium yellow onion
- 1 green bell pepper, seeded
- 2 celery stalks
- 2 tbsp vegetable oil
- 1 can (15 oz) black-eyed peas
- 1 cup chopped tomatoes (or 14.5 ounces canned, peeled, whole tomatoes)
- 1 cup vegetable broth
- salt and pepper, to taste
- red pepper flakes (optional, to taste)
- 2 tbsp chopped parsley (optional, for garnish)
- 2 to 3 cups of cooked rice





Preparation:



1. Finely chop the garlic, onion, celery, and green bell pepper.



2. In a skillet, heat the vegetable oil and gently sauté the garlic, then the onion, until fragrant. Add the celery and green pepper and sauté until tender.



3. Drain and rinse the black-eyed peas. Add them, along with the tomatoes, to the vegetables and season with salt, pepper, and/or pepper flakes. Mix in the broth and bring everything to a simmer.

4. Cook for 15 minutes then season with salt and pepper to taste. If using parsley, sprinkle it over the top of the Hoppin' John to added color.

5. Serve the Hoppin' John over cooked rice.

NOTE: Hoppin' John is usually made by simmering the beans with ham hocks. This is a vegetarian version. If you like, try adding in 1/2 cup of chopped uncooked bacon when cooking the vegetables.



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