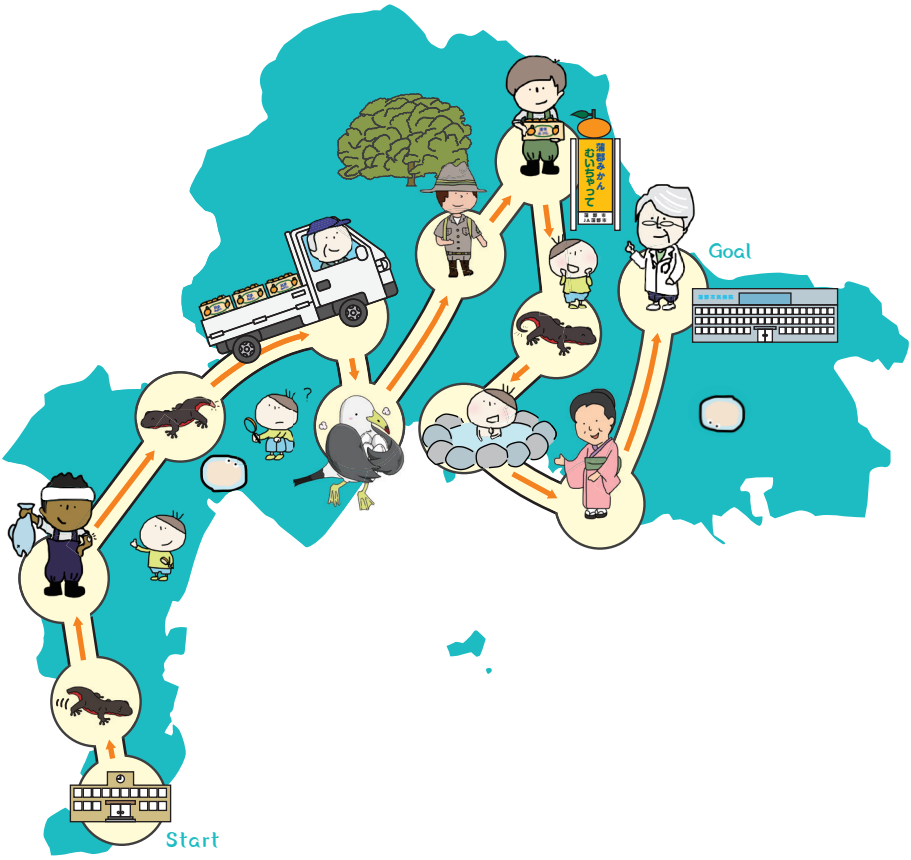
Do you know Regenerative Medicine?

The story of Gamagori City and regenerative medicine Daily Calendar

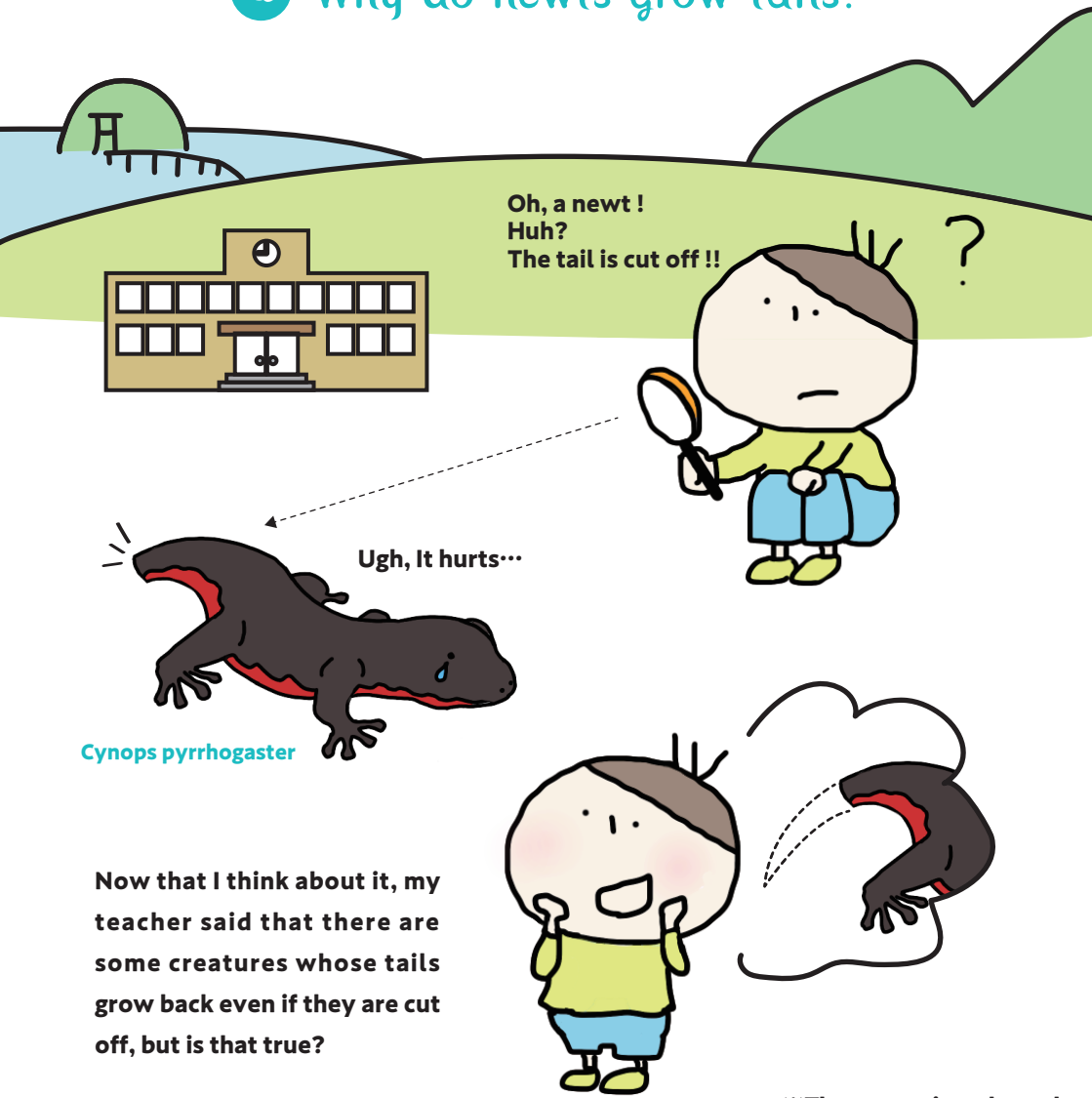


Planning and Conception：Gamagori Regenerative Medicine Industrialization Promotion Committee Illustration Creation：Japan Tissue Engineering Co., Ltd.

Created in February 2022

1

Q Why do newts grow tails?



Now that I think about it, my teacher said that there are some creatures whose tails grow back even if they are cut off, but is that true?

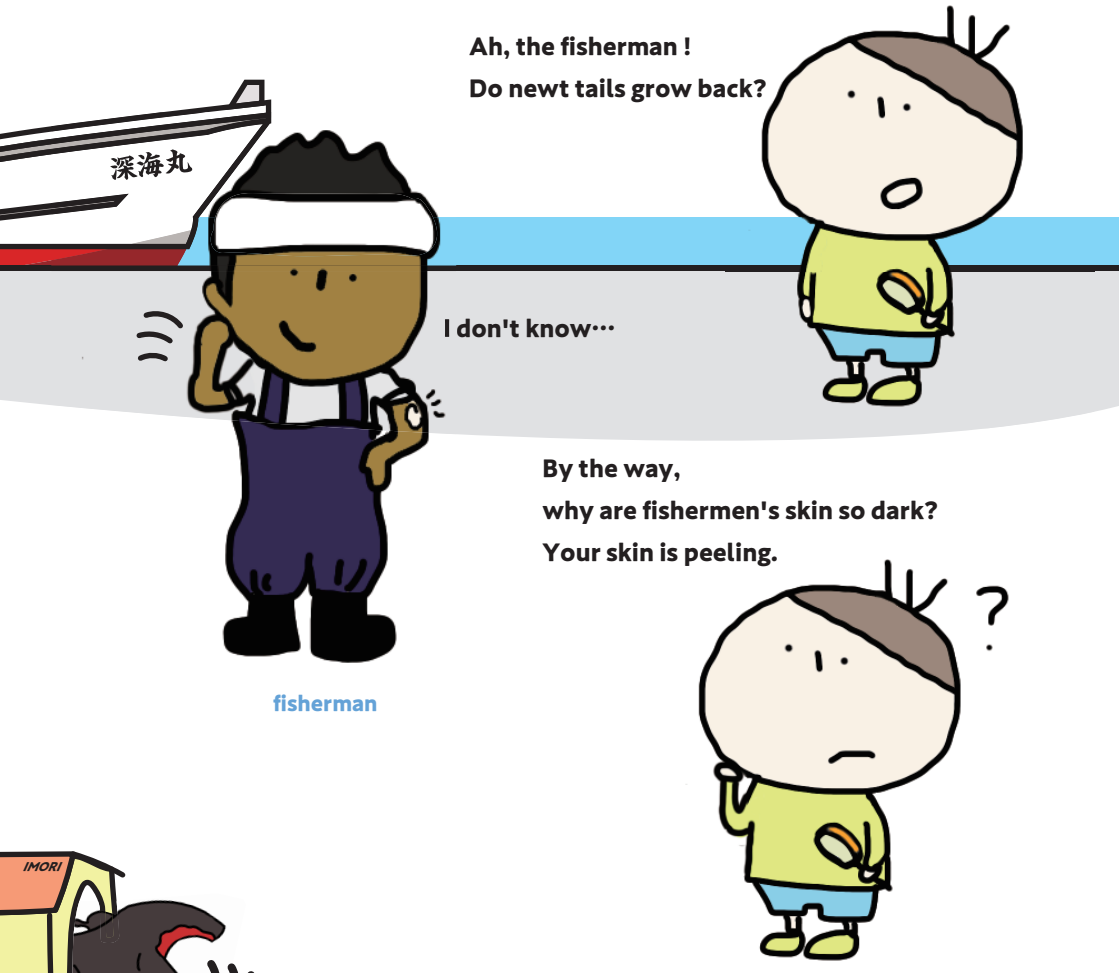
※The answer is at the end

2

Let's look around the Gamagori City
to ask people about it!

3

Q Why does skin get darker when it gets sunburned?

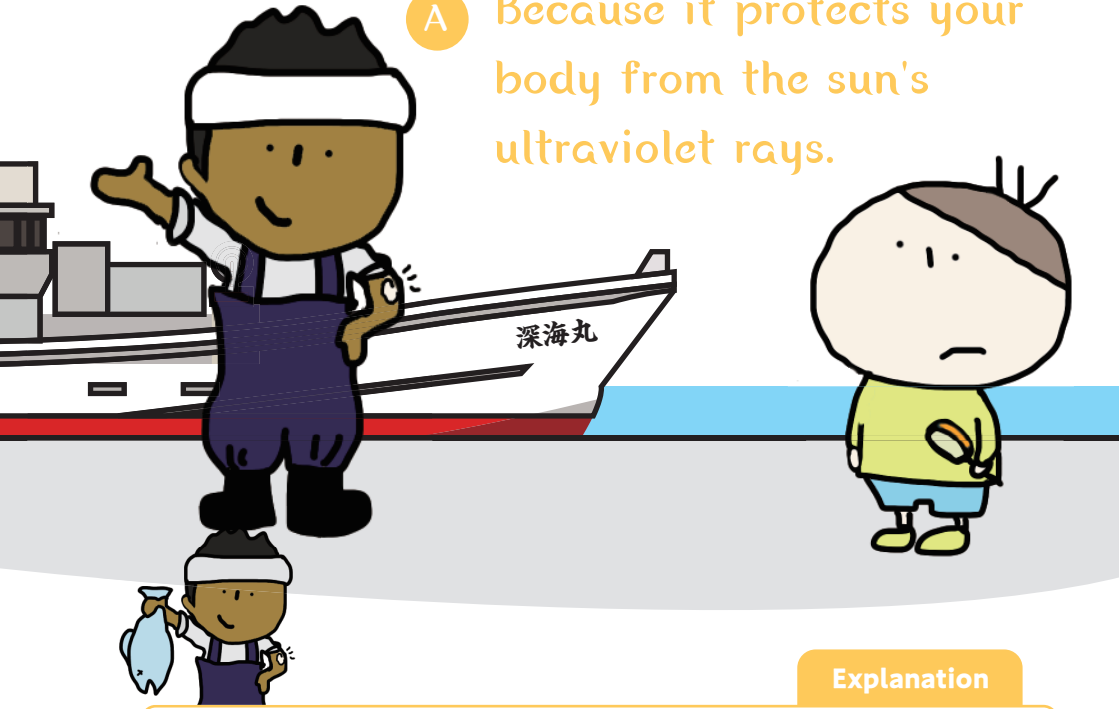


Q

Why does skin get darker when it gets sunburned?

4

A Because it protects your body from the sun's ultraviolet rays.



Explanation

When exposed to sunlight, the black pigment called melanin on the surface of the skin increases, causing the skin to darken. Melanin helps block too much UV rays from penetrating the body. Too much exposure to UV rays can lead to skin cancer, so be careful. When playing outside, wear a hat and apply sunscreen to protect your skin. Sunburn causes the cells on the surface of the skin to die, causing the skin to peel. Don't worry, your skin regenerates every day. This is evidence that old cells have been shed and the sunburn has healed. It is important to keep your skin hydrated if you have a sunburn.

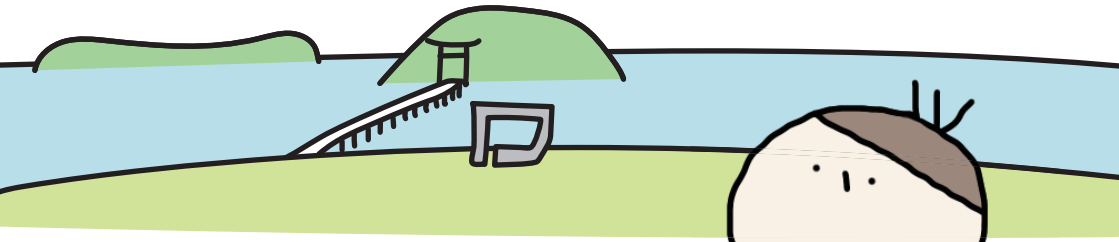
Check !

Gamagori City's Fisheries Industry

Got it!

5

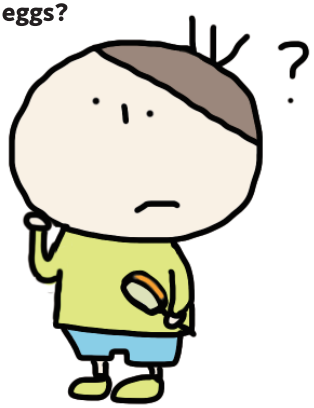
Q Why are you warming the eggs?



Bird, what are you doing?

I'm warming the eggs.

Why are you warming the eggs?



Black-headed Gull

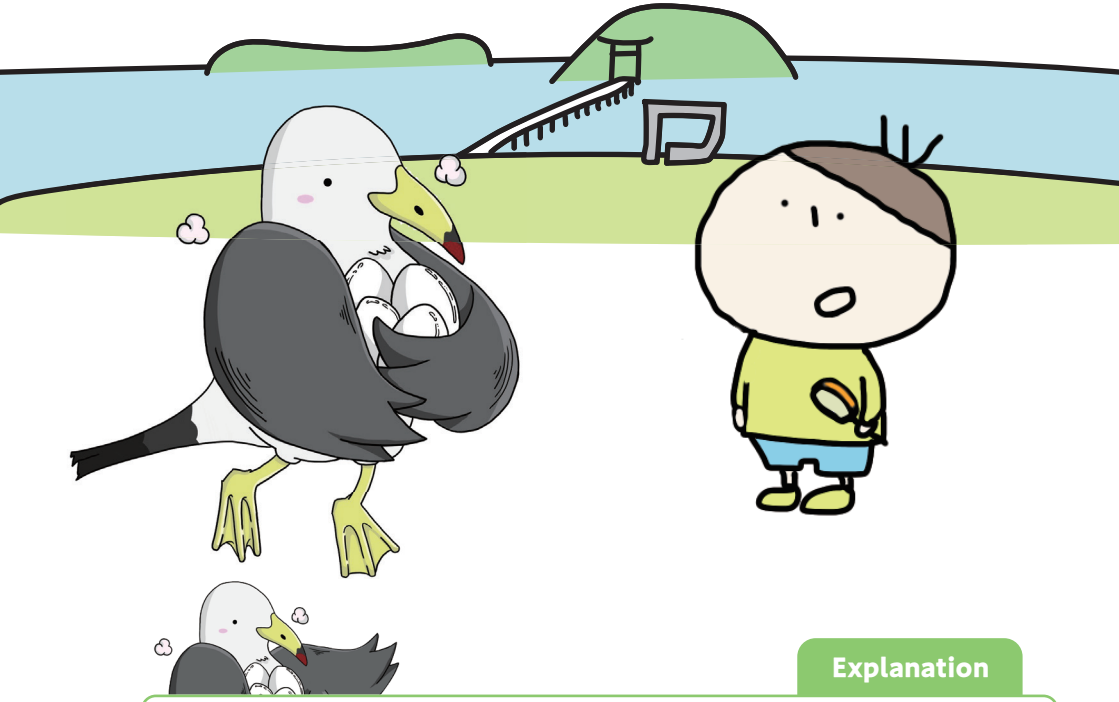
Q

Why are you warming the eggs?

6

A

Eggs need a certain temperature to hatch.



Explanation

In order for chicks to hatch, they need to be kept warm, have just the right temperature and humidity, and be turned at least four times a day.
This allows the heart, feathers, and beak to form inside the egg, and after about 25 days a chick will emerge. It's amazing how eggs only have a yolk and white, yet when you warm them a chick emerges. Birds, like humans, have a constant body temperature and are therefore able to keep their eggs warm. Newts that hiding in the house there, are cold-blooded animals. Therefore, they do not warm the eggs. Above all, we feel cool and comfortable when we warm up the eggs.

7

Comphor tree

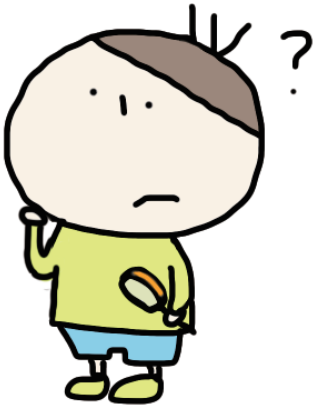
Q Why do trees live so long?

Curator

This tree is over 1000 years old.

It's a very big tree.

Why do trees live so long?

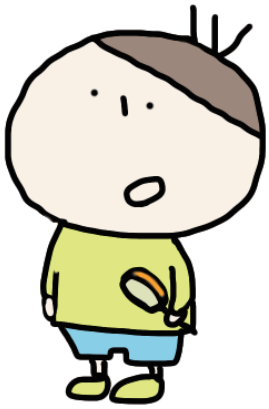


Q

Why do trees live so long?

8

A Actually, only part of it is alive.



Explanation

This tree is a camphor tree in Gamagori city, and is a nationally designated natural monument. This is the largest camphor tree in the Chubu region.
The surface of the tree is hard, but new cells are produced inside and as these cells grow the tree grows. A collection of dead cells in the center of the trunk forms bones that support the tree. Trees can live long lives because they use not only living cells but also dead cells to support their bodies.

Check !

Comphor tree in Gamagori

Got it!

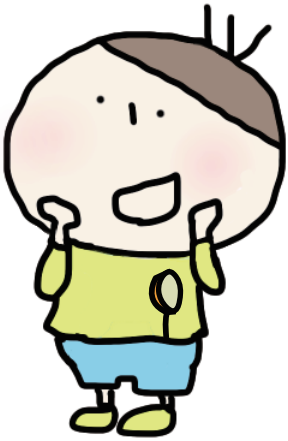
9

Q How are new varieties of mandarins produced?

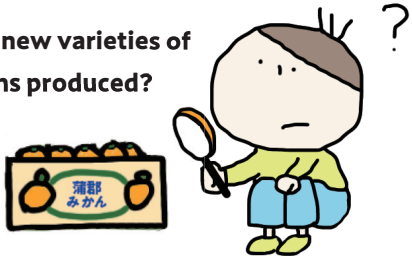
Mandarin orange farmer

We harvested a lot of delicious mandarin oranges this year too.

By the way, you said that a new kind of mandarin orange had been born the other day.



How are new varieties of mandarins produced?



Q

How are new varieties of mandarins produced?

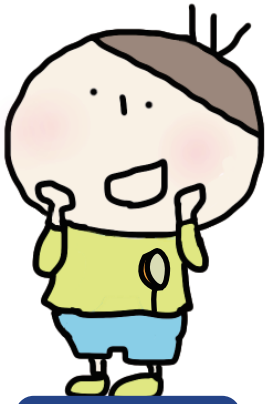
10

A We crossbreed mandarins with different characteristics.

Oh! There you are!

Mandarin orange farmer

Oh, my grandpa !



Explanation

Mandarin farmers create new varieties by cross-pollinating different types of mandarins in their fields. These new varieties are developed to be delicious and resistant to diseases. A new variety of mandarin orange called"Yuyakehime" has been produced in Aichi Prefecture. Named after its color, which resembles the Gamagori sunset, this mandarin orange is very sweet and easy to peel. This mandarin orange took 24 years to be born.

Check !

"Yuyakehime" produced in Aichi Prefecture

I love the mandarin oranges grown in Gamagori, they're very sweet and a little sour.

11

Q Why does bathing in a hot spring make your skin smooth?

I'm tired from walking around the city. Let's take a break and get into a hot spring.

My skin has become so smooth. Why does bathing in a hot spring make my skin smooth?

Q

Why does bathing in a hot spring make your skin smooth?

12

A

Because it removes dirt from your pores and makes your skin moist.

By the way, there is a fireworks festival tomorrow. I'm looking forward to seeing some big fireworks too.

The landlady of a hot spring inn

Explanation

Hot springs are relaxing and have a beautifying effect on the skin. The components of the hot spring soften the keratin layer of the skin and remove dirt from the pores. Additionally, the hot spring promotes blood circulation and activates metabolism, making the skin smooth. There are many different types of hot springs in Gamagori, so try them all!

Check !

Hot springs in Gamagori city

Got it!

13

Oh!

Oh, fireworks!

Boo-Hoo,I scraped my knee and it started bleeding. Let's go home.

Beautiful fireworks!

By the way,

Q why do we bleed when we get injured?

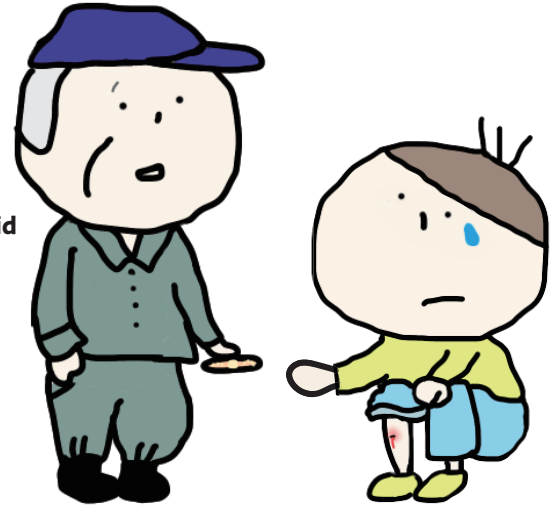
Q

Why do we bleed when we get injured?

14

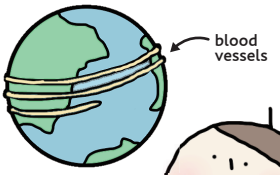
A

Because the blood vessels are damaged. That's why blood comes out.



Explanation

Inside the body, there are "blood vessels" that carry blood. When you get injured and your skin or flesh is cut, the blood vessels underneath also get damaged. As a result, blood flows out from that area. When bleeding occurs, it is important to clean the wound by rinsing it with tap water to remove any sand or mud.



The length of blood vessels in your body is 100,000 km!.

15

Q Why the injury heals on its own?

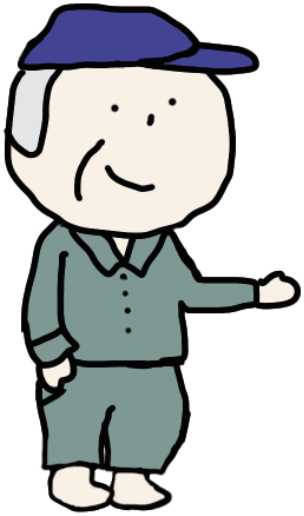
Q

Why the injury heals on its own?

16

A

Because the body has the ability to return to its original state.



Did you call?

Explanation

Humans have a natural healing ability that protects the body by fighting germs that enter the body from outside and relieving pain. When you have a cold, eating foods that are easy to digest and keeping warm can help you recover naturally, and this is also thanks to the body's natural healing powers. Small cuts will heal naturally, but larger injuries will not heal naturally.

What to do in case of serious injury?

Check !

Cold prevention **Search**

Got it!

17

Q What are cells?

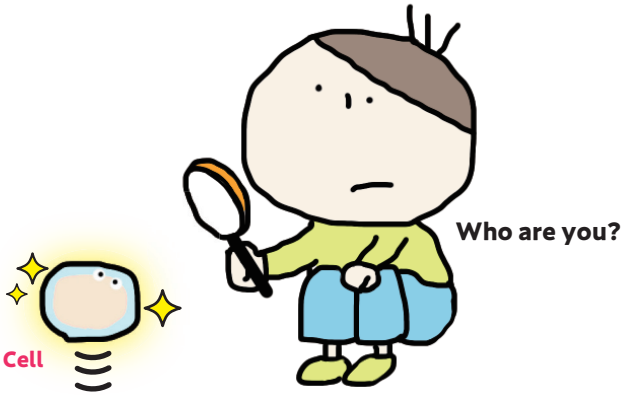
Q

What are cells?

18

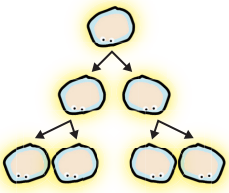
A

Cells make up our bodies.
The bodies of all living things are made of "cells."

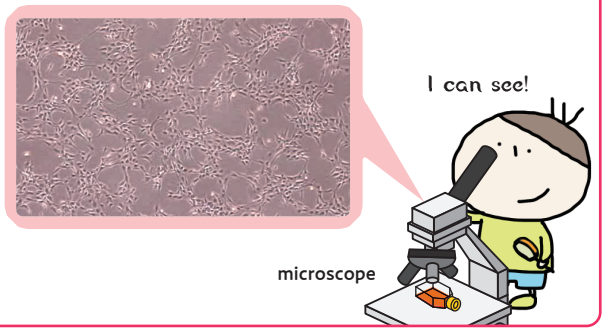


Explanation

Humans were originally a single cell called a fertilized egg. One cell becomes two, then four…then 37 trillion cells. Our skin, our mouths, and our blood are all made up of cells. It may seem strange to you, but the yolk of a bird's egg is actually one large cell. Cells are so tiny that we need a machine called a microscope to see them.



Cells multiplying



19

Q How many types of cells are there?

Now I know that my body is also made up of cells and they increase. Are there many types of cells?

Good question!

Did you call me?

It's time to appear!

I've been waiting for this!

Itch ···

Q

How many types of cells are there?

20

It seems the question has been answered.

A

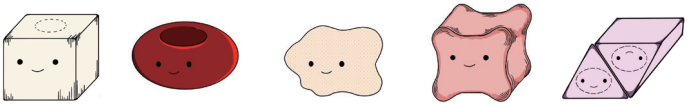
There are about 270 types of cells in the human body.

Yes! The cells multiply.

Explanation

Humans grow by eating a balanced diet and getting the nutrients they need. Plants grow when given water and nutrients. This is because the cells absorb nutrients and grow. The human body contains 270 types of cells with different sizes, shapes, and functions. Even in adulthood, cells in the body are replaced very slowly. For example, all skin cells are replaced approximately every 45 days. Not only can they multiply inside the body, but they can also be grown outside the body if they are provided with nutrients and grown in a clean environment with constant temperature and humidity.
The process of multiplying cells outside the body is called proliferation.

Types of Cells(examples)

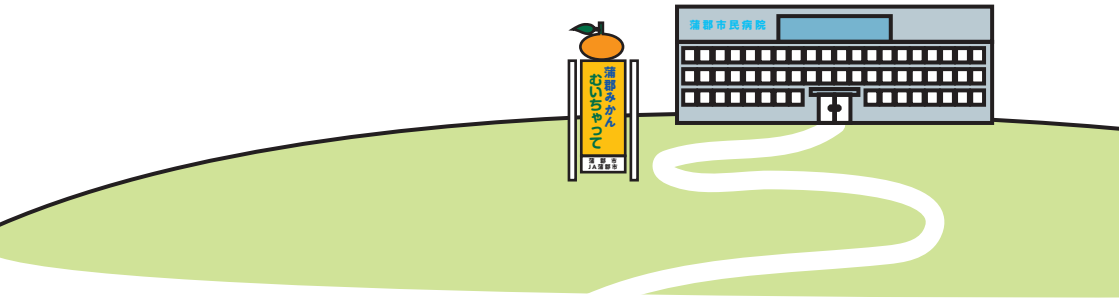


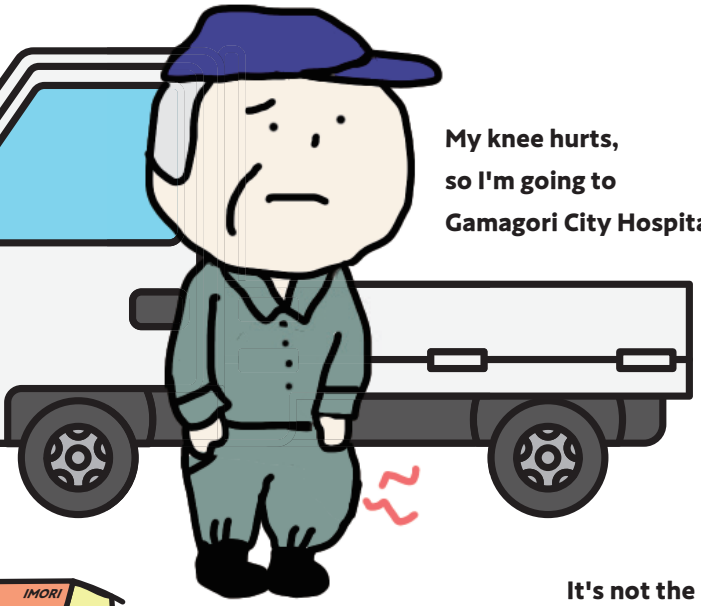
Bone cells | Blood Cells | Fat Cells | Muscle Cells | Skin Cells

Got it!

21

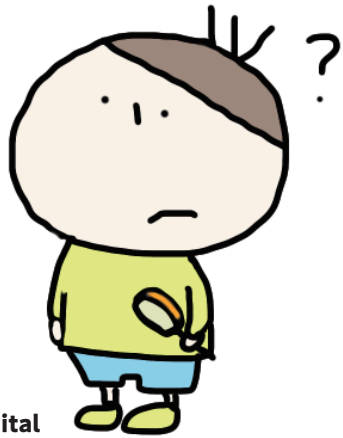
Q What Gamagori City Hospital does?





My knee hurts,
so I'm going to
Gamagori City Hospital.

Where are you going?



It's not the hospital
I usually go to.

Q

What Gamagori City Hospital does?

22

A

Gamagori City Hospital is a hospital that treats serious injuries and illnesses that cannot be treated at a clinic.

Explanation

Gamagori City Hospital has 29 specialized wards and provides medical care for seriously ill and hospitalized patients 24 hours a day, 365 days a year. An ambulance will also be there. Gamagori City Hospital will conduct tests and diagnose illnesses. The cells may also be examined to check for cancer. Because we are affiliated with Nagoya City Hospital, you can receive specialized treatment on par with that of a university hospital.

Check !

Gamagori City Hospital

23

Q What is regenerative medicine?

Q

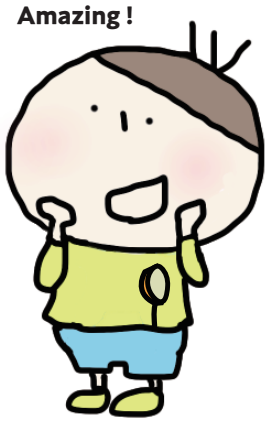
What is regenerative medicine?

24

A

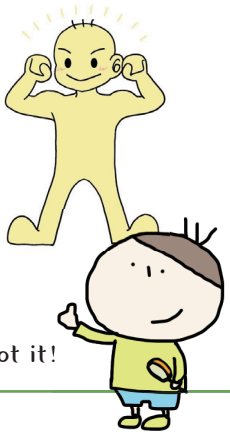
We call treatments using cells, Regenerative Medicine.

Doctor



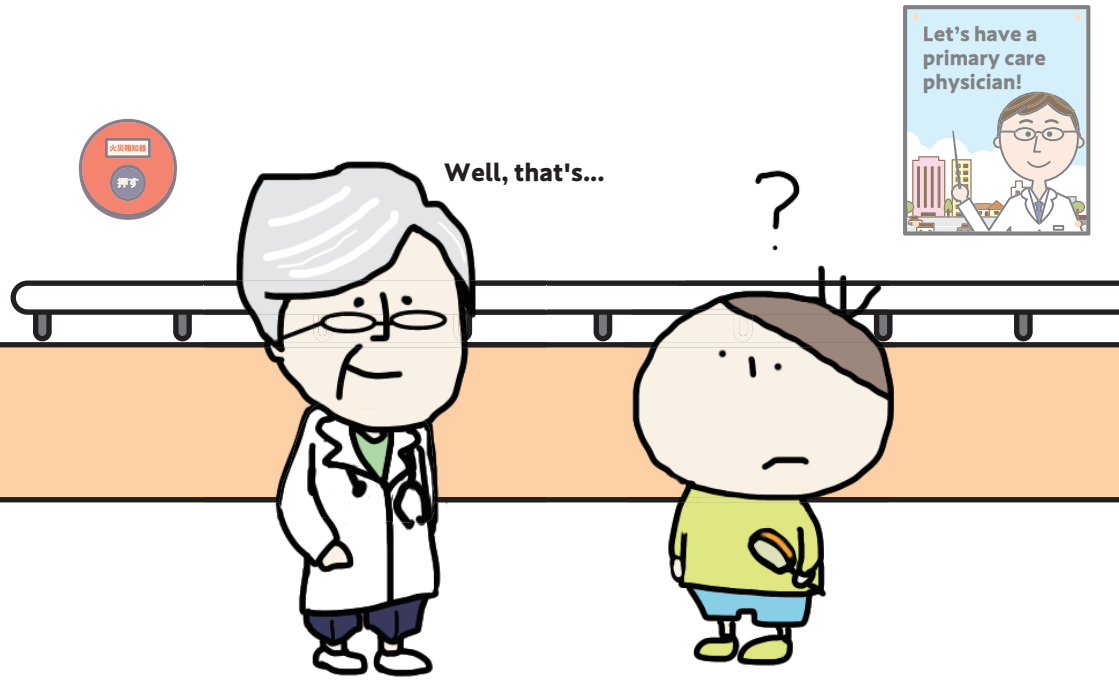
Explanation

Restoring what has been lost is called regeneration. Regenerative medicine involves extracting cells from the body, culturing them, and transplanting them into the area that needs them to treat an illness or injury. Using cells may make it possible to cure serious illnesses and injuries that cannot be cured naturally. Many people need to work together to bring regenerative medicine, a new medical treatment, to the many patients suffering from illness. First, let's learn about regenerative medicine.



25

Q What diseases can be cured with regenerative medicine?



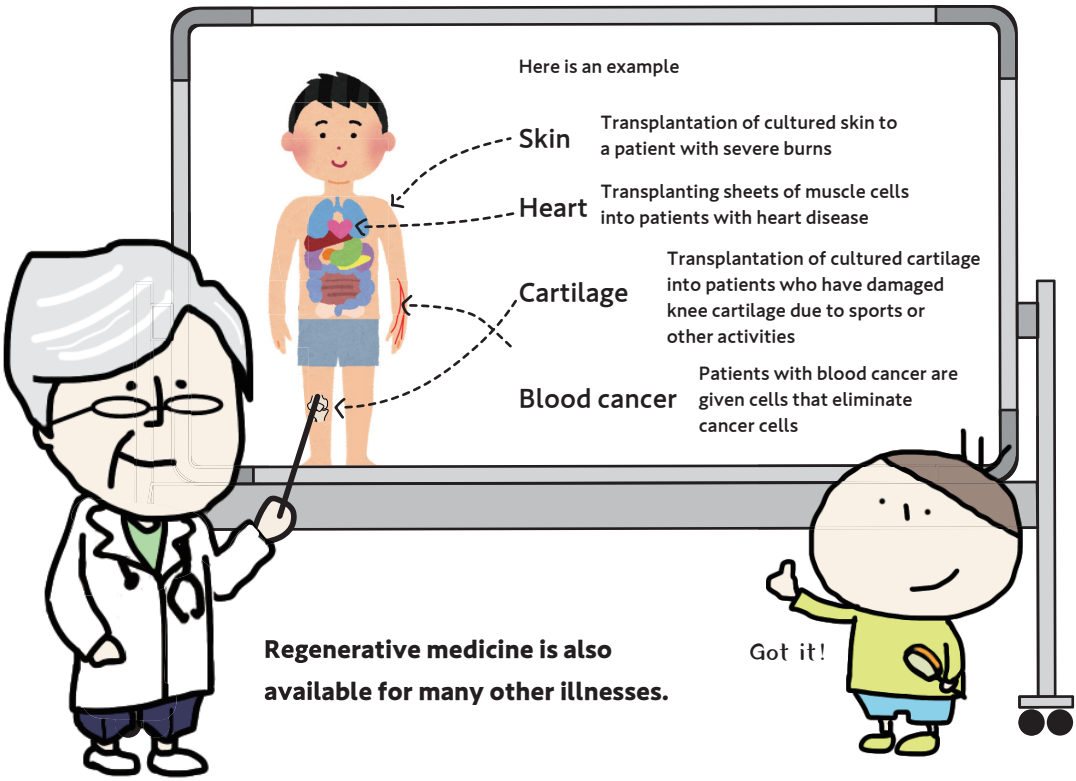
Q

What diseases can be cured with regenerative medicine?

26

A

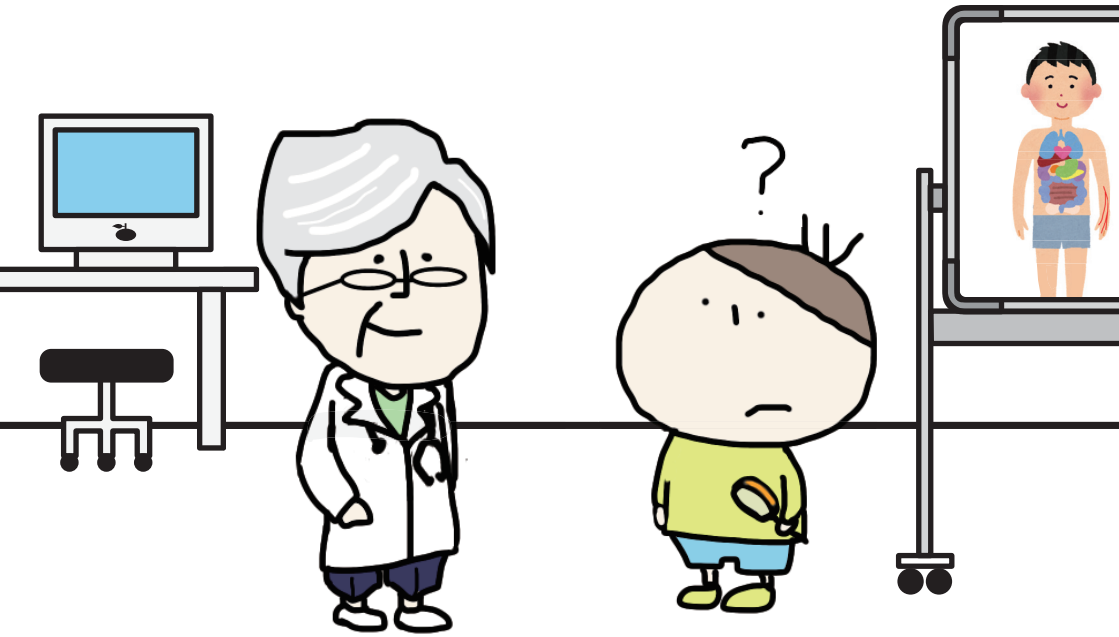
Currently in Japan, the following diseases can be treated with regenerative medicine.



Regenerative medicine is also available for many other illnesses.

27

Q Can I receive regenerative medicine treatment at Gamagori City Hospital?

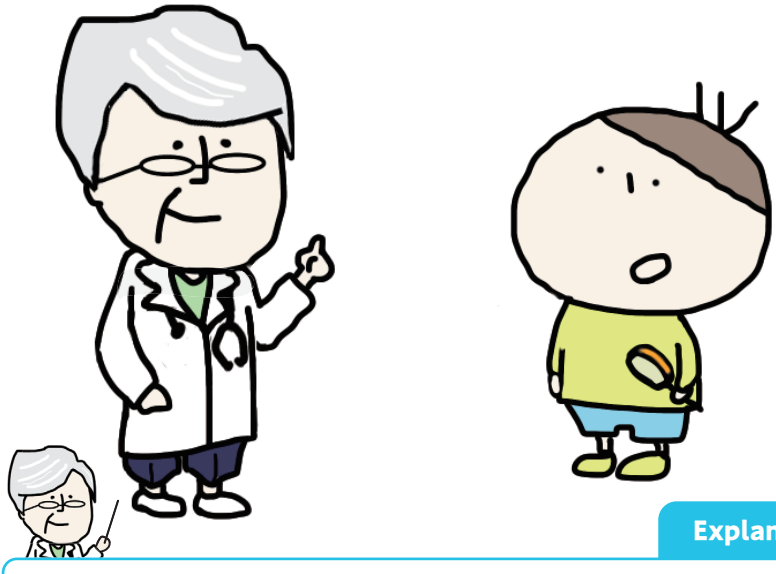


Q

Can I receive regenerative medicine treatment at Gamagori City Hospital?

28

A Gamagori City Hospital is providing regenerative medicine treatment.



Explanation

A congenital disease that causes blisters (epidermolysis bullosa) can be cured using regenerative medicine. Diseases that cause loss of skin color (vitiligo) can also be cured with regenerative medicine.

Gamagori City is working to make regenerative medicine available for other illnesses as well. Gamagori City Hospital has a committee that reviews regenerative medicine, and the city, hospital, and company are working together on various initiatives.

Check !

Regenerative Medicine at Gamagori City Hospital

29

Q Why do newts grow tails?

So that's where the newt was !

Ah, the newt's tail has grown !

Yes, I was going to ask about the newt's tail ! Is this "Regeneration" too?

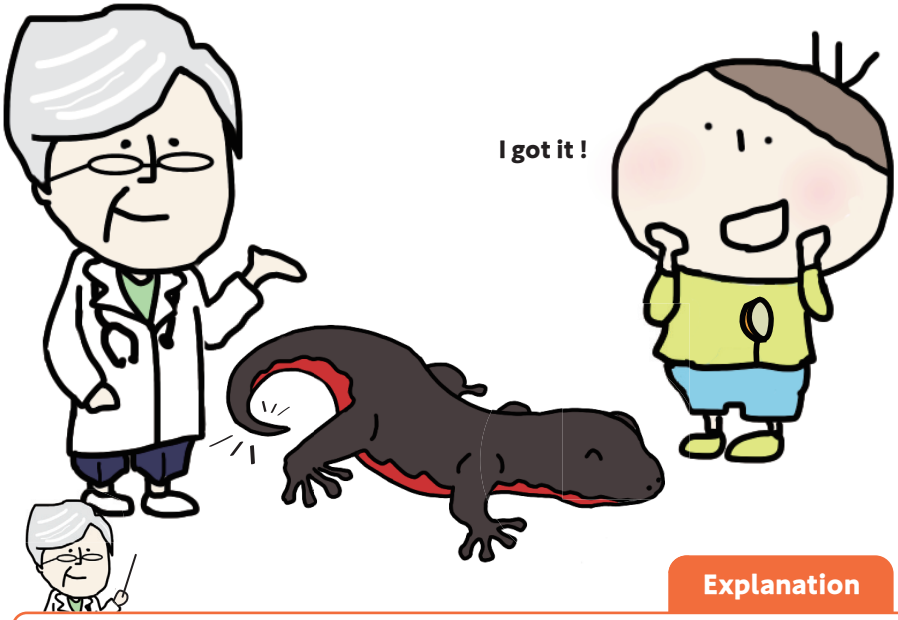
Q

Why do newt grow tails?

30

A

This is because cells that can change into various types of cells are born in the wound.



Explanation

The bodies of living things are made up of cells with various characteristics. There are cells that differ in size and function. For example, there are cells that make bones and cells that make muscles. In the human body, once a cell has a specific function, it will not change into another cell. On the other hand, newt cells can change into cells with different functions even after their function has been determined. For example, when a tail is cut off, cells gather at the wound and give rise to cells that can transform into various other cells. These cells transform into the bones and muscles needed for the tail, allowing the tail and legs to regenerate. Investigating the mechanism of regeneration in newts may also be useful in regenerative medicine research.

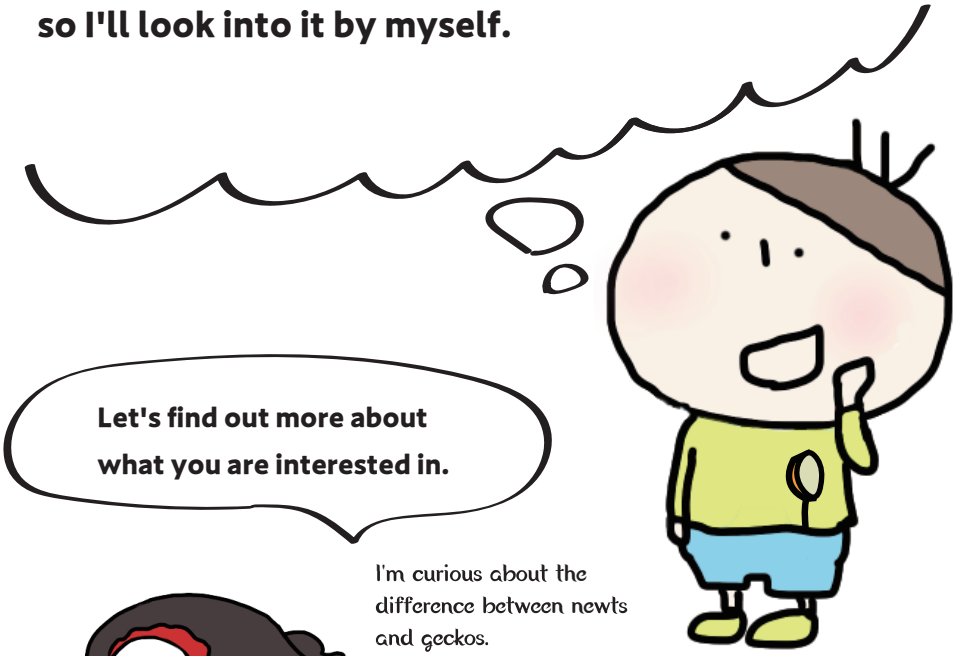
31

I met and talked with many people today in the city.

I learned a lot from them.

I want to learn more,

so I'll look into it by myself.



Check !

Story of regenerative medicine