

まんがでわかる



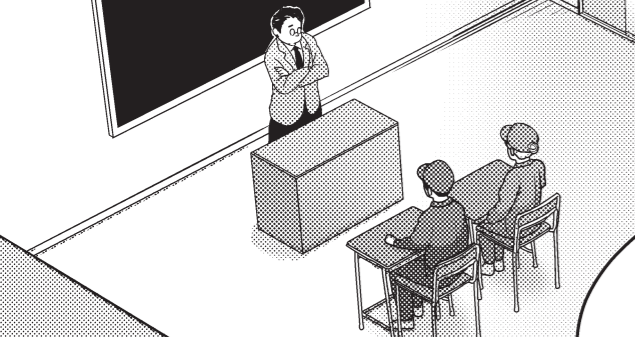
English
英語

溶接の安全衛生

Learn through Manga
Health and Safety for Welding



This audiovisual material has been created for the purpose of learning the basics of health and safety for those who work in welding.



Today, we'll learn about health and safety for welding!

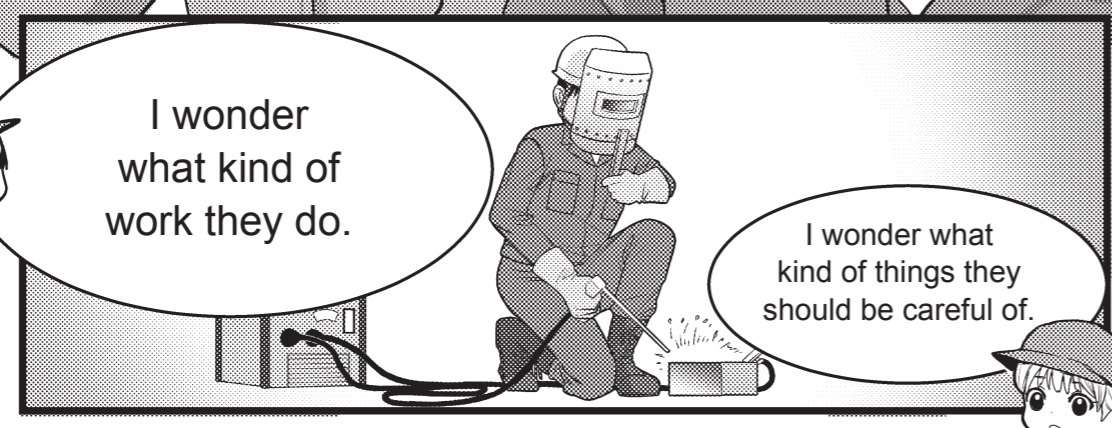


Because you'll be dealing with hot objects and heavy materials, it's important to pay attention to safety.

Totally!

I wonder what kind of work they do.

I wonder what kind of things they should be careful of.

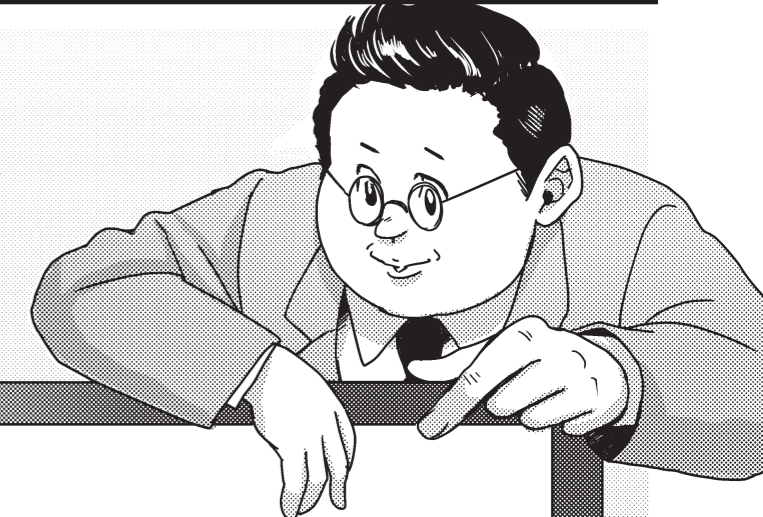


Let's find out about this field's industrial injury occurrences.

Okay!



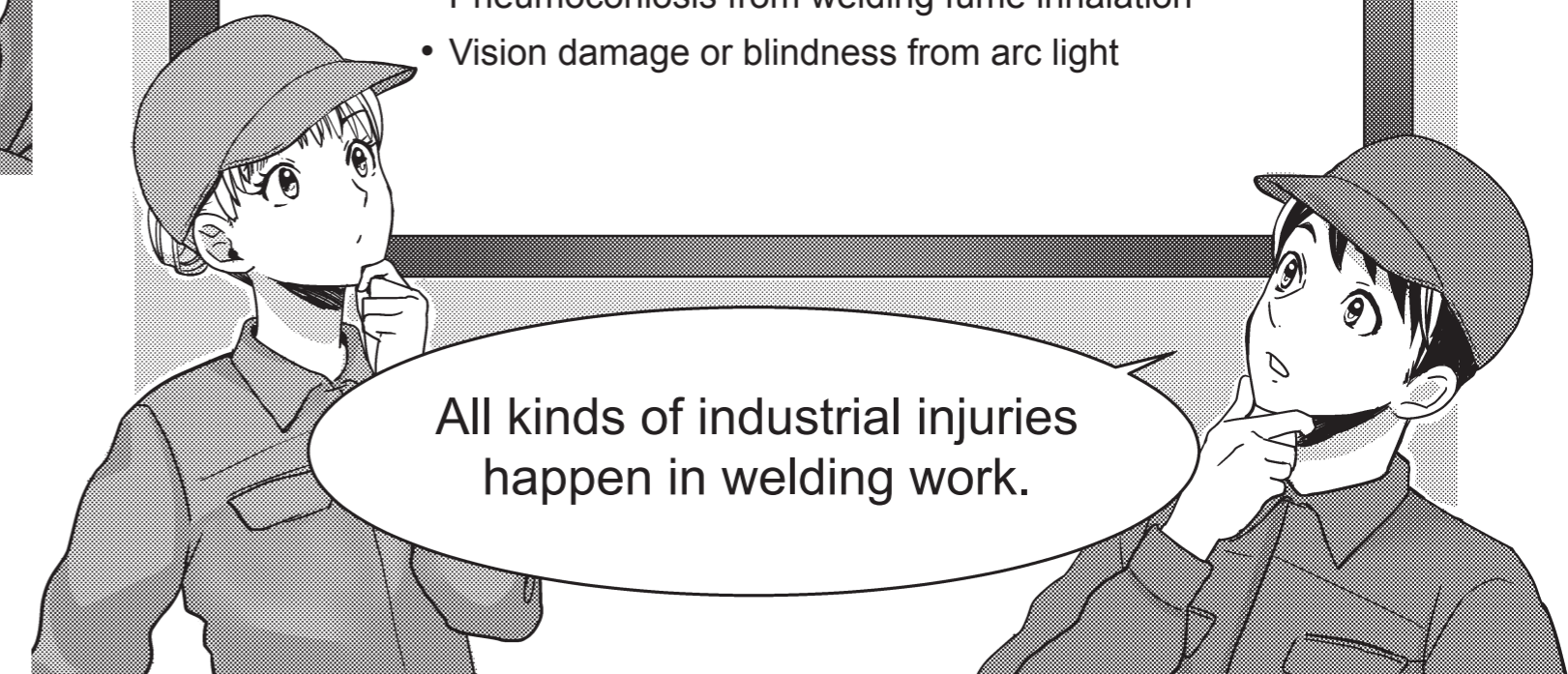
Here are the main industrial injuries happening in welding work.



Industrial injuries in welding work

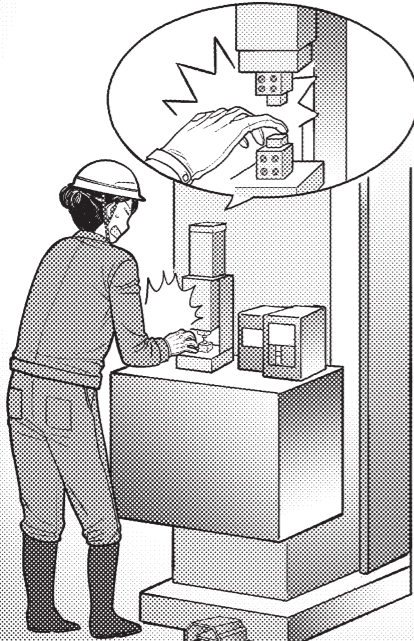
- People or body parts being caught in, under, or between machinery or tools
- Contact with hot objects
- Being struck by moving/falling objects
- Falls from elevated areas
- Electric shock from welding power sources
- Pneumoconiosis from welding fume inhalation
- Vision damage or blindness from arc light

All kinds of industrial injuries happen in welding work.




That's right.
Now, let's take a look at specific cases of industrial injuries.

For example, there are cases where people got their finger caught in a spot welding machine due to not following the rules....



...and there are also cases where materials collapse or fall on people.



Why do these industrial injuries happen?

One of the main reasons is not abiding by rules designed to ensure the safety of the workers.

What kind of rules are there?

When you work on a task that is different than usual, such as inspection, repairing, or debris removal, it's important to stop the welding machine and wait to ensure that the machine has completely stopped before performing these tasks.

Oh, that's very basic.
I thought there would be more complex rules.

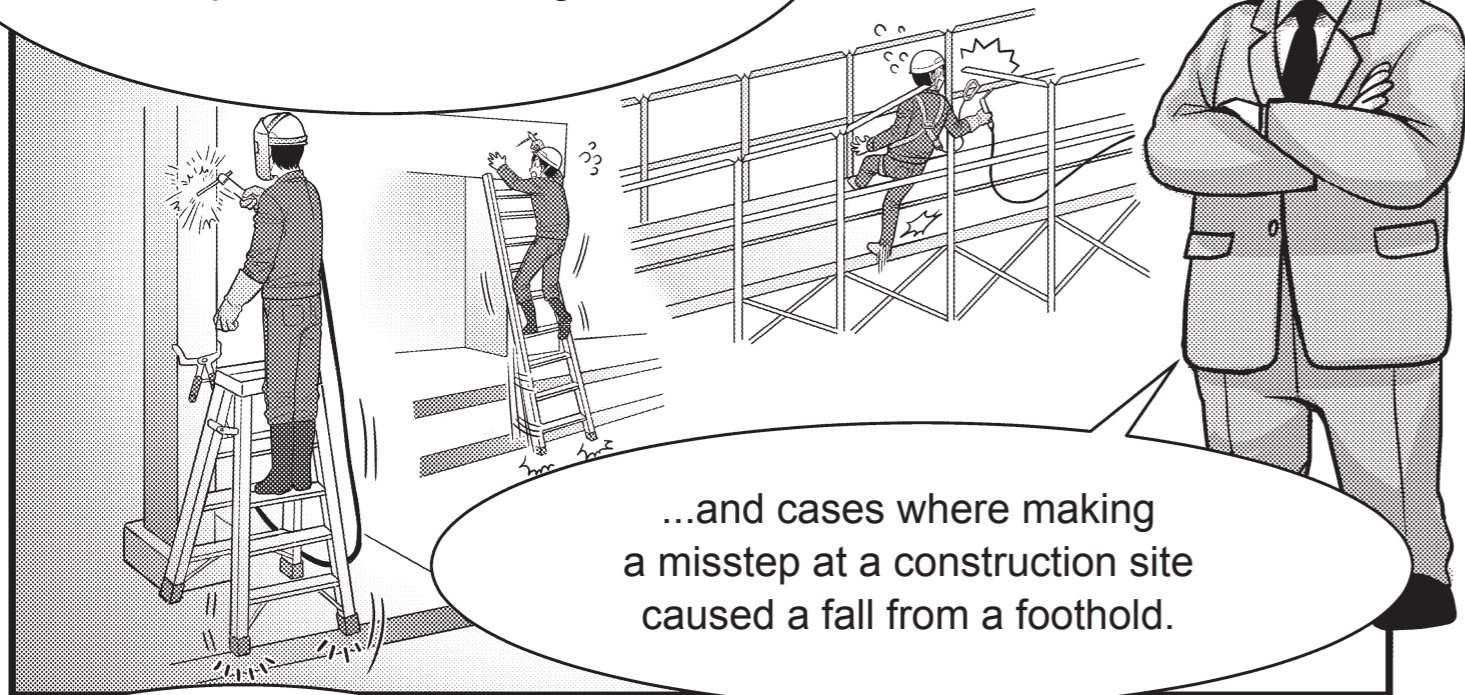
Hm?

It is essential to abide by the rules to prevent any industrial injuries from happening!

Y-yes, sir!

アホ...

There are also other cases where people broke their bones due to falling from stepladders and ladders placed on uneven ground...



...and cases where making a misstep at a construction site caused a fall from a foothold.

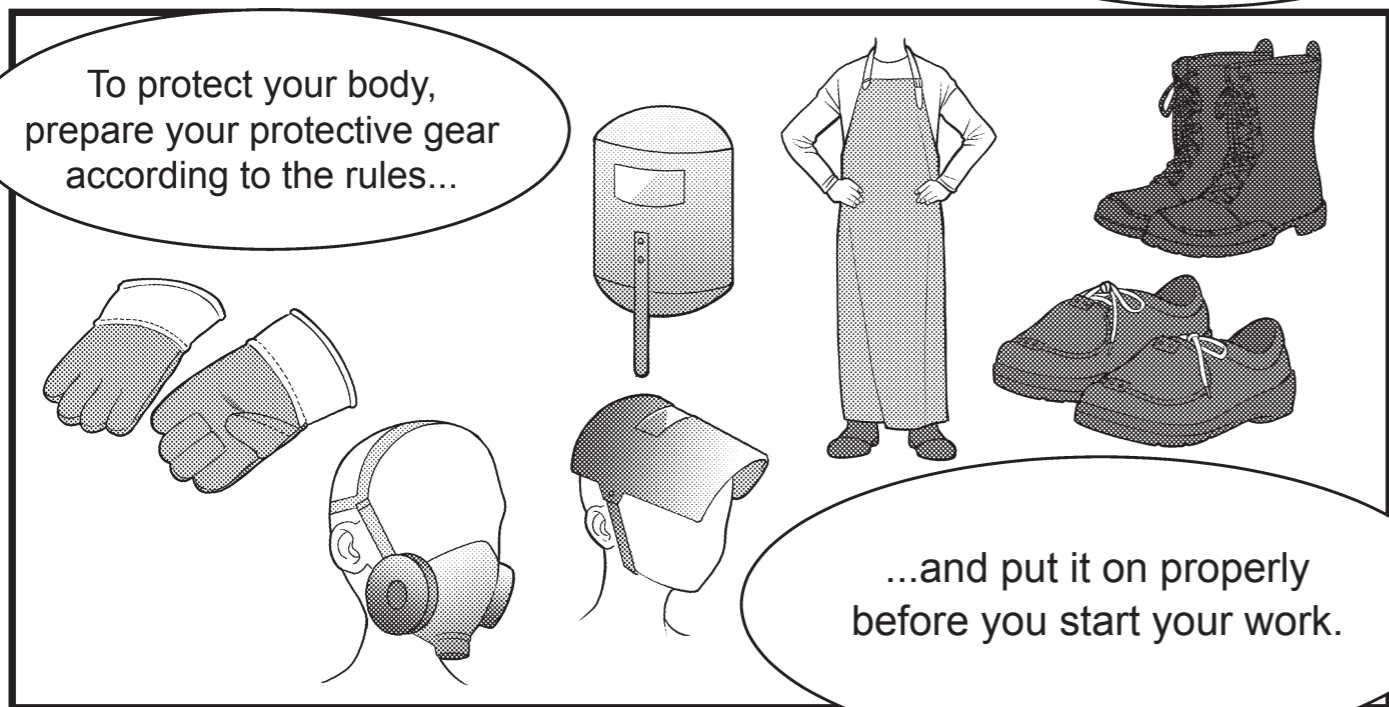
The work sounds so dangerous.



That's exactly why it's important to follow the rules with care.



To protect your body, prepare your protective gear according to the rules...



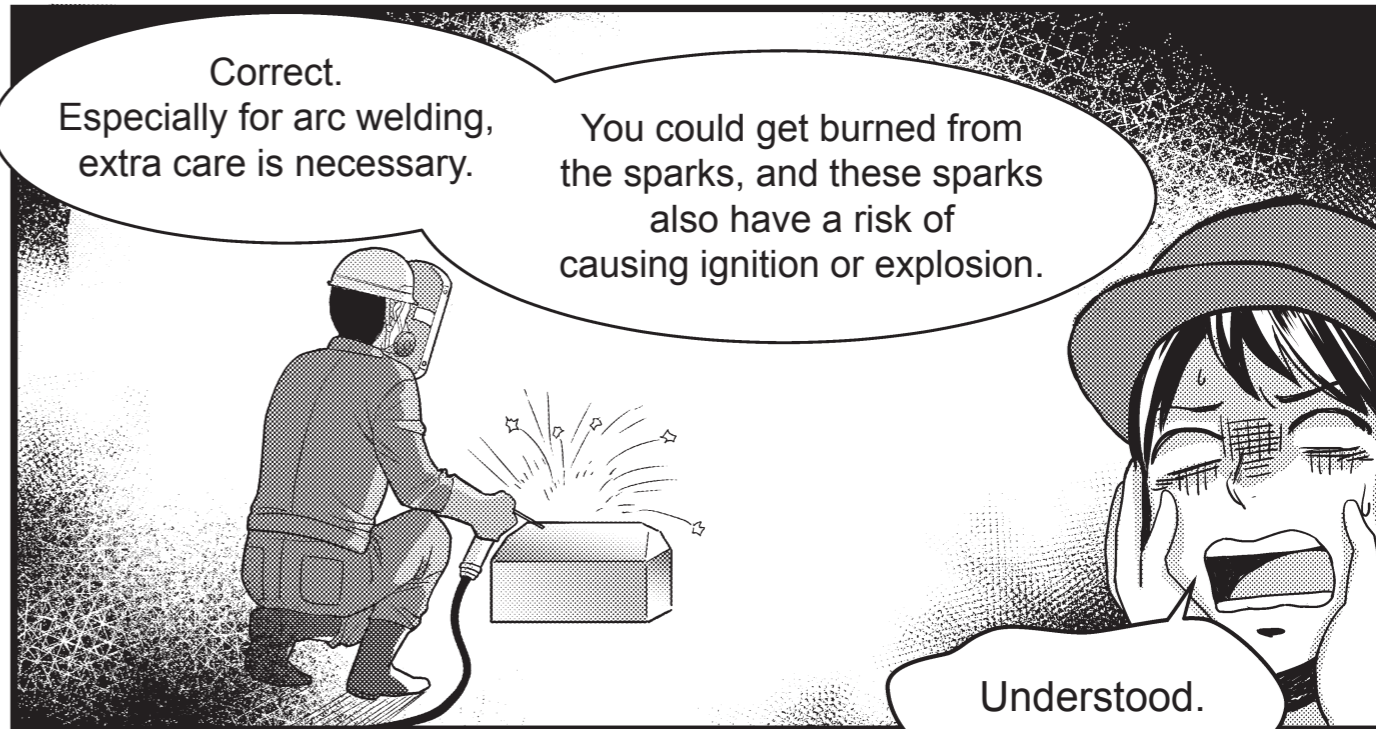
...and put it on properly before you start your work.

We also have to be careful of contact with hot objects, right?



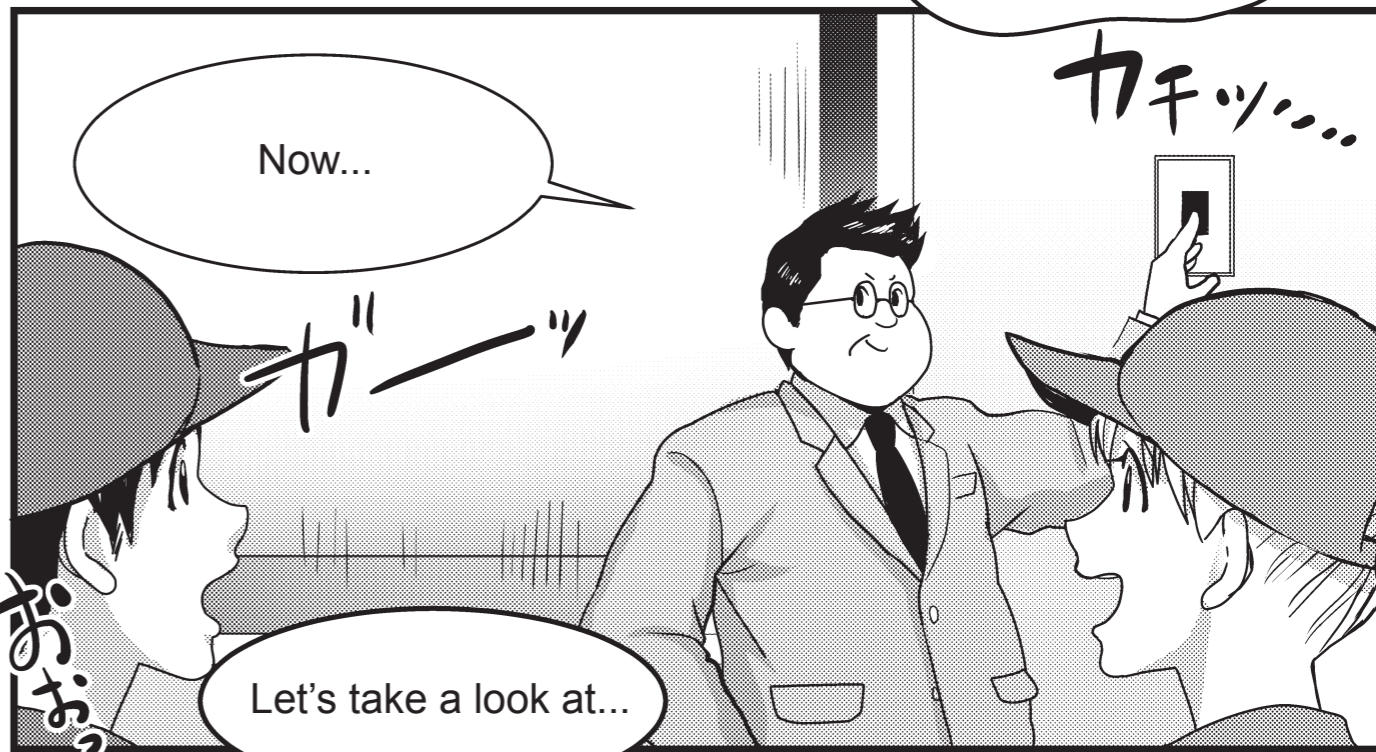
Correct. Especially for arc welding, extra care is necessary.

You could get burned from the sparks, and these sparks also have a risk of causing ignition or explosion.



Understood.

Now...



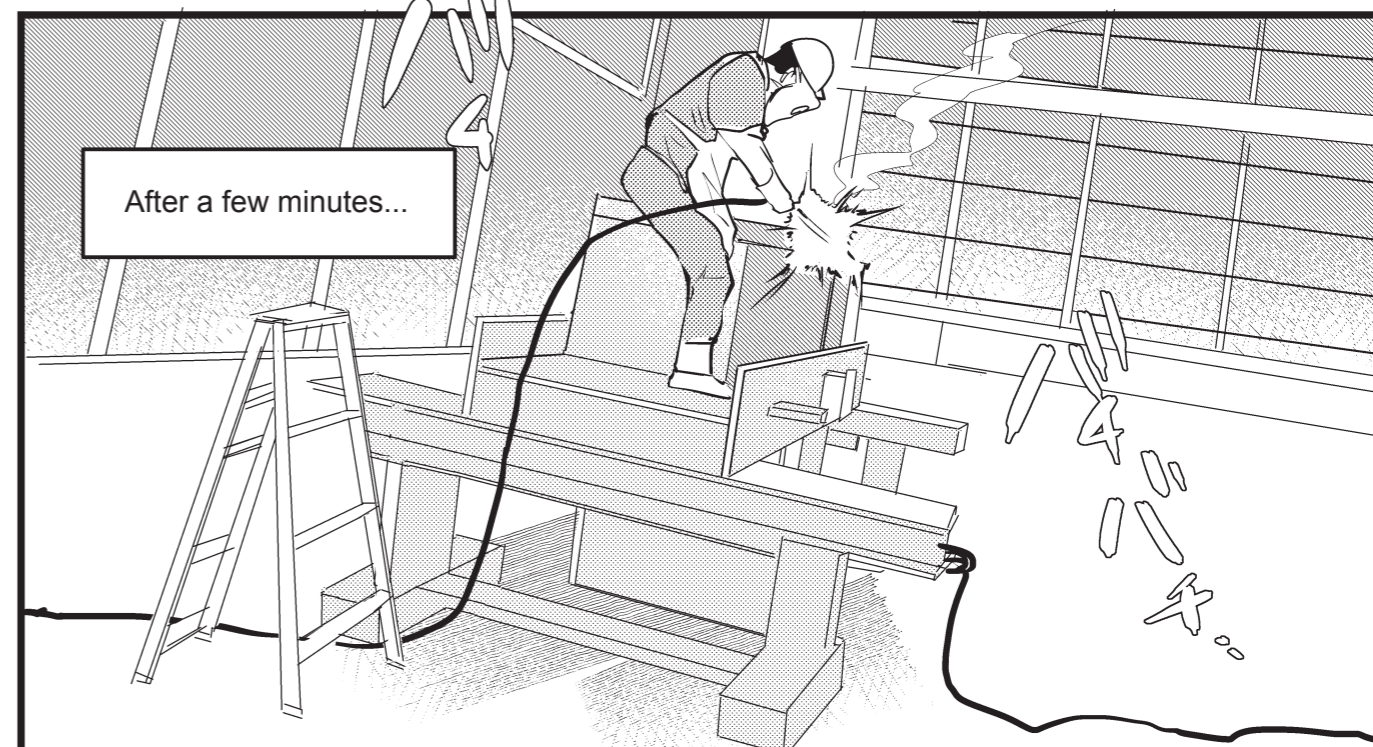
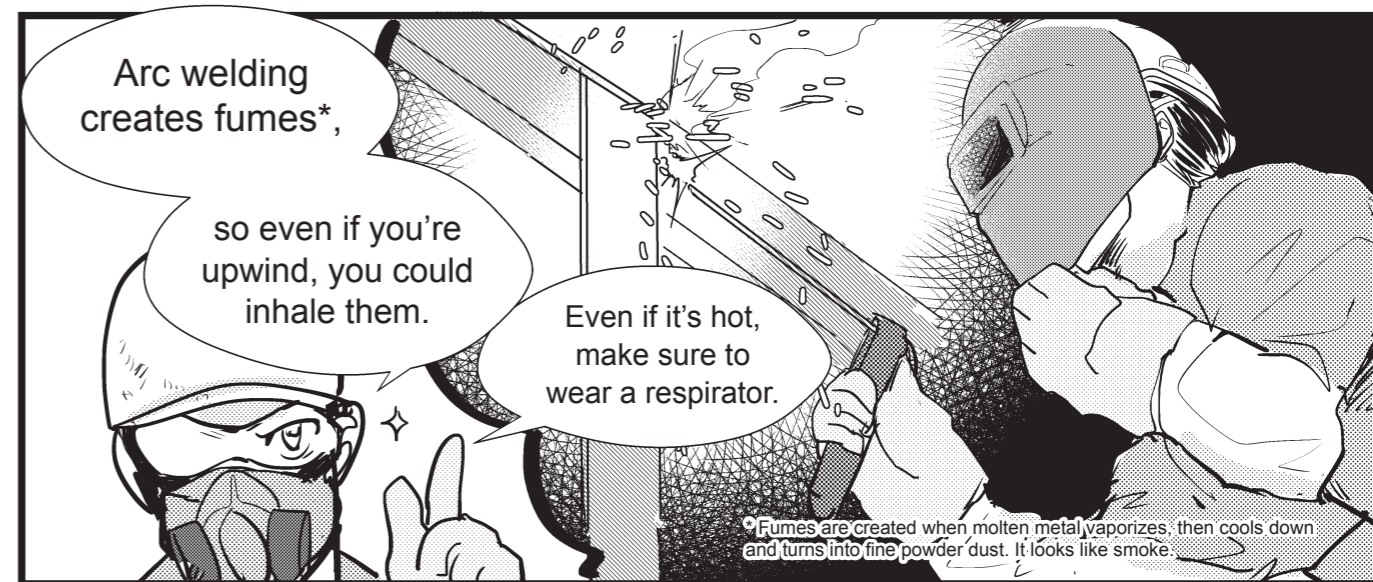
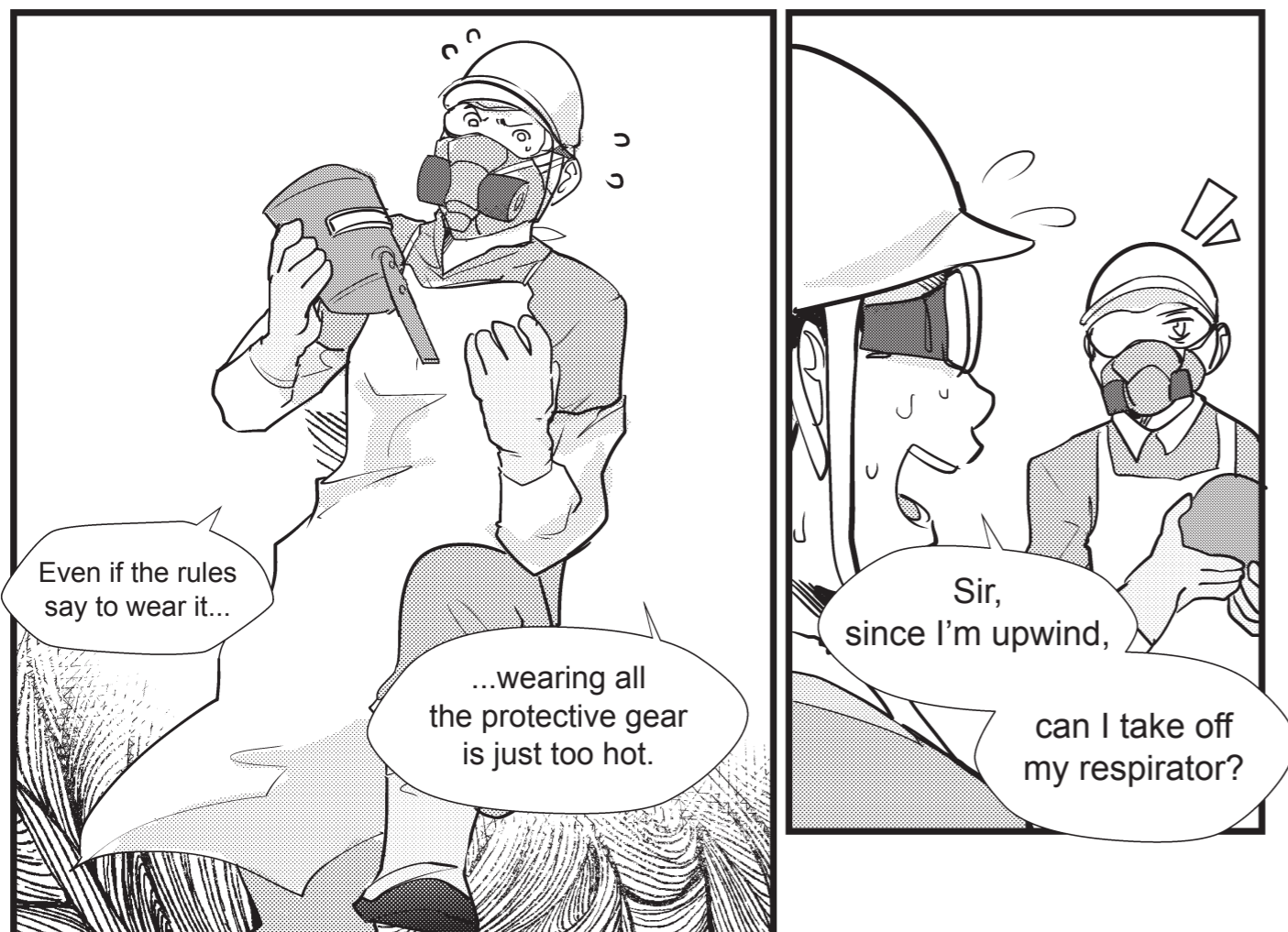
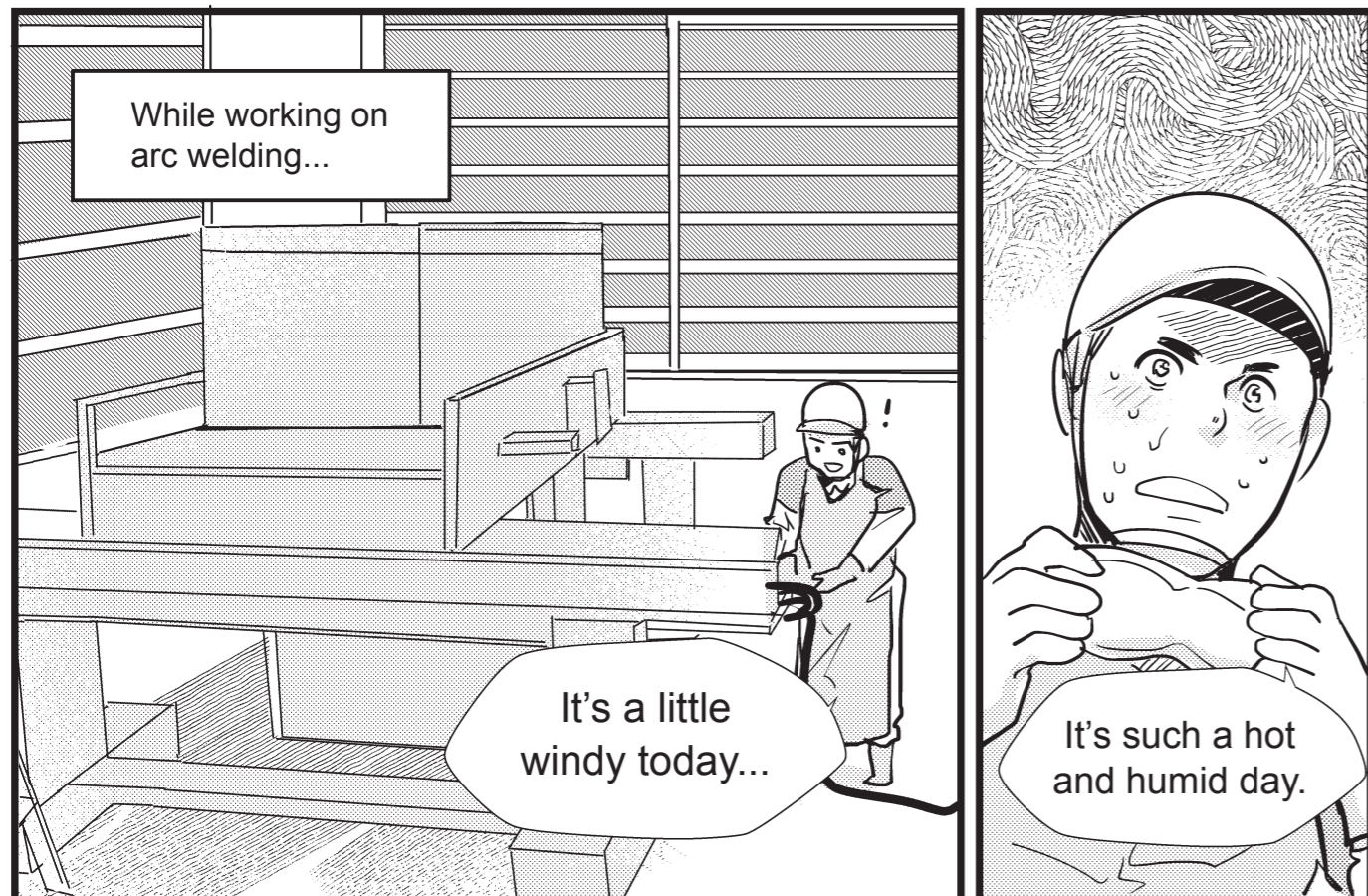
Let's take a look at...

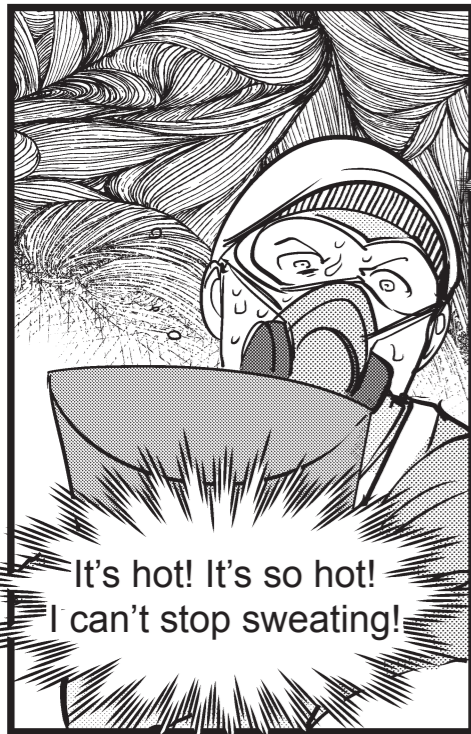
...some actual cases!



Case 1

Wear your protective gear





It's hot! It's so hot!
I can't stop sweating!

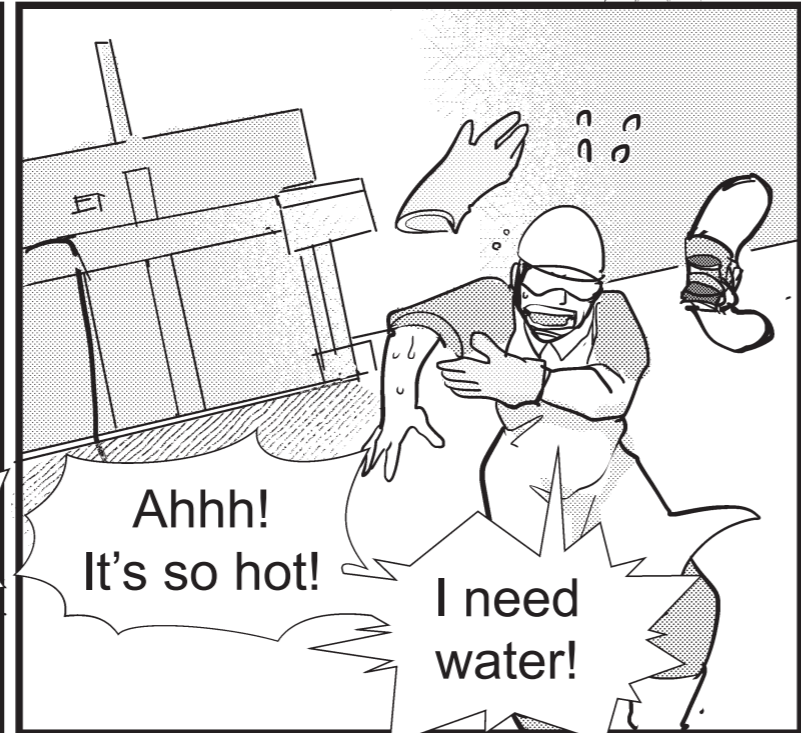


I'm almost done...

...but I'm getting lightheaded.

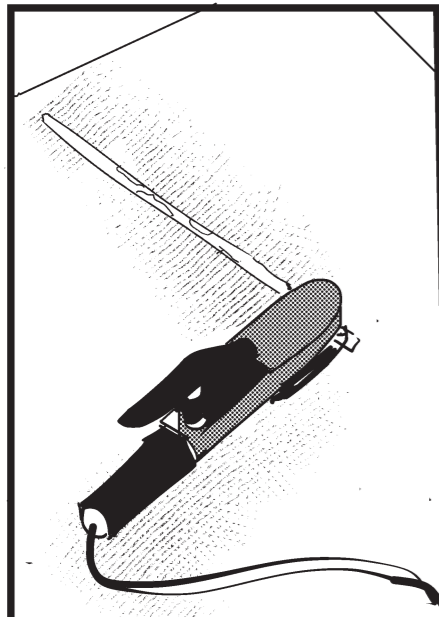


Okay!
It's done!

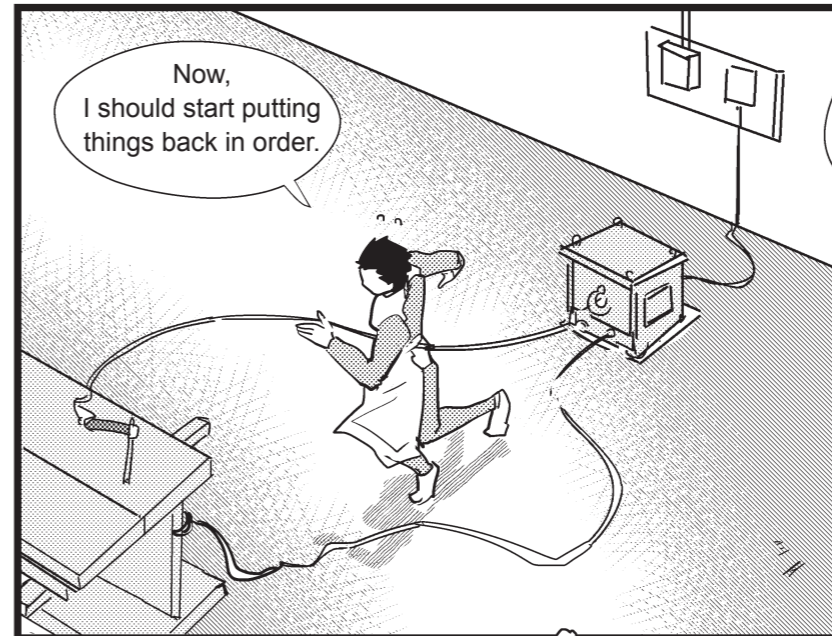


Ahhh!
It's so hot!

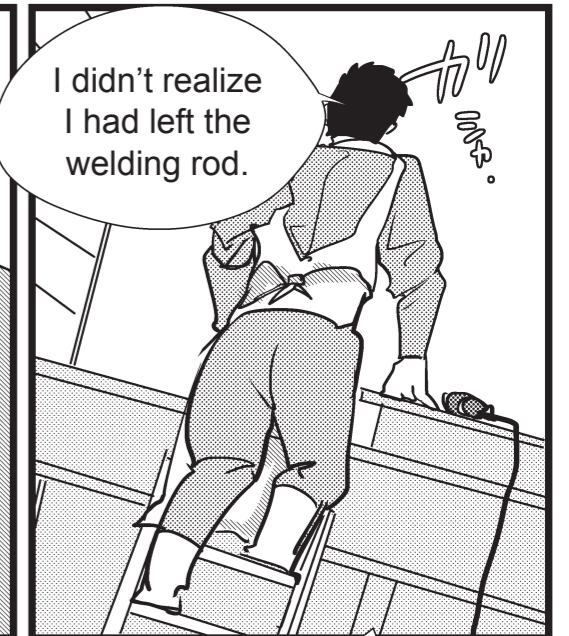
I need water!



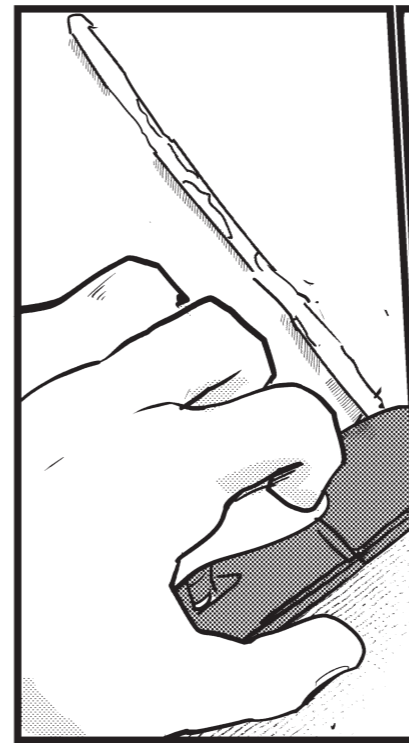
Phew,
I'm alive again!



Now,
I should start putting things back in order.



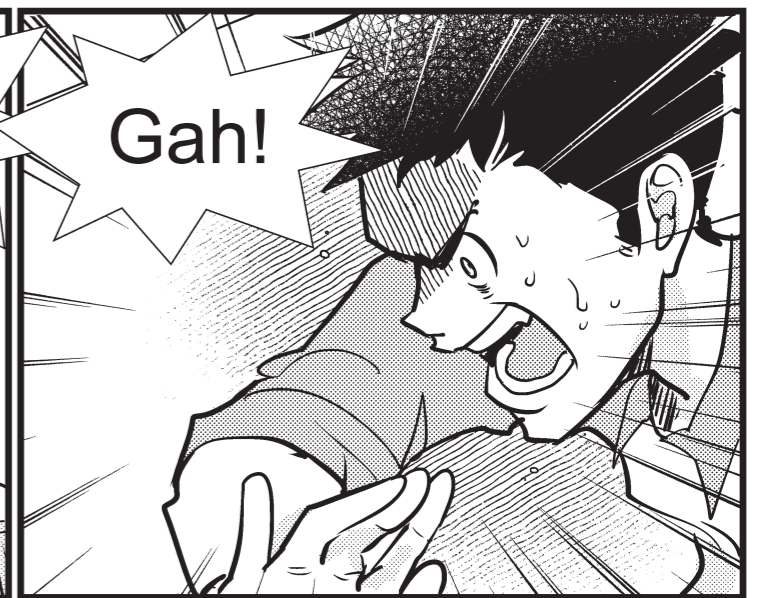
I didn't realize
I had left the
welding rod.



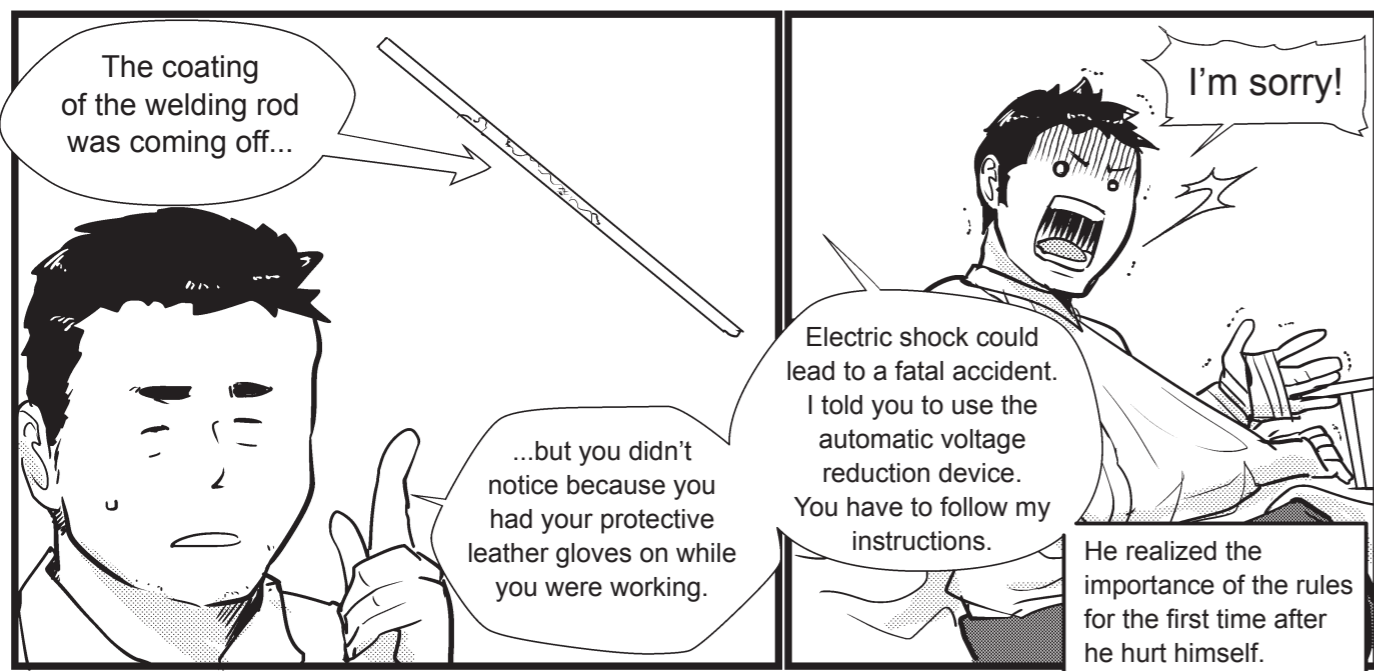
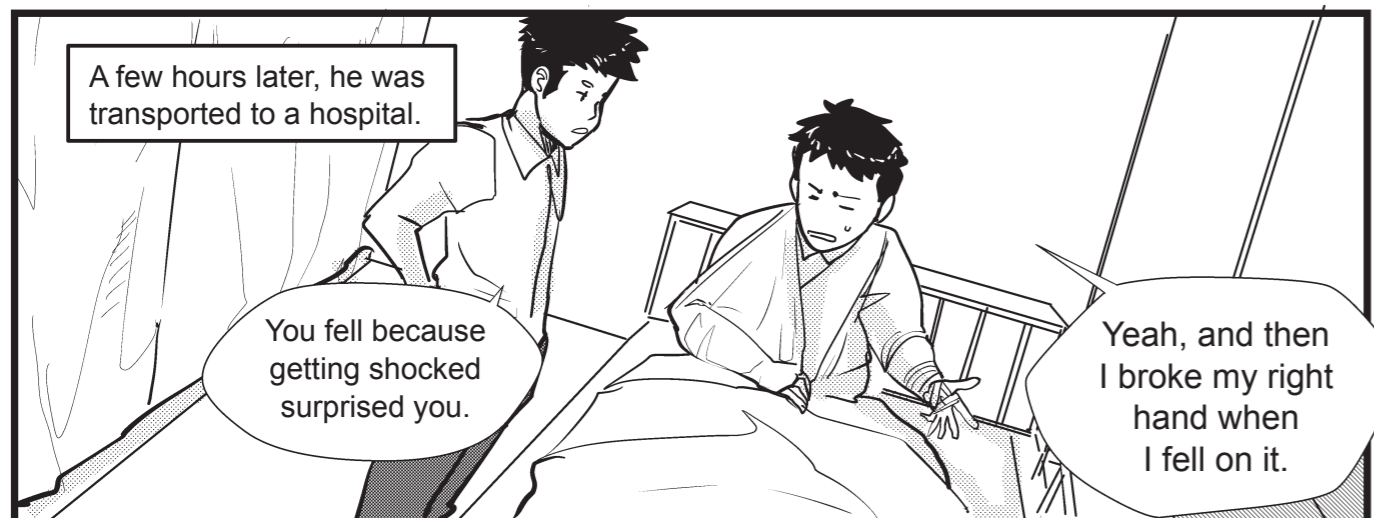
I forgot to turn
off the power!



Whoa!

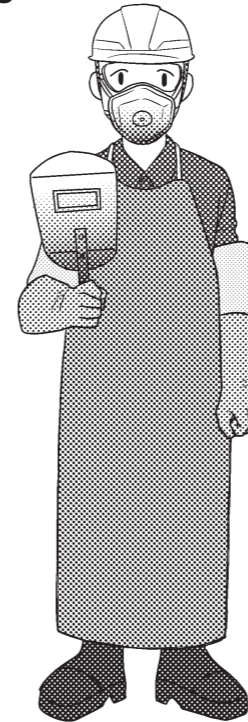


Gah!

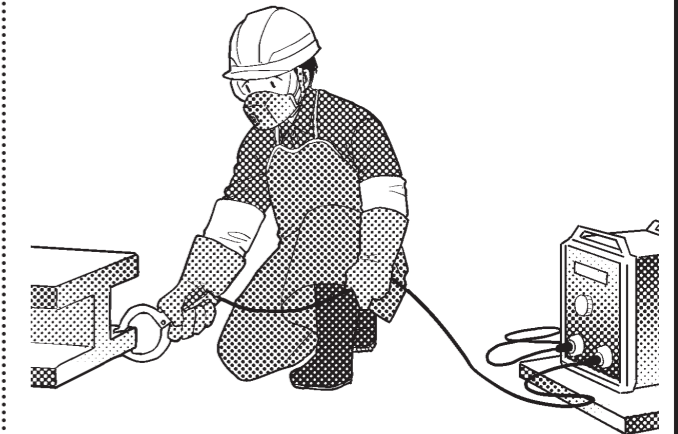


Case 1 summary

1 Wear specified work clothes and protective gear!

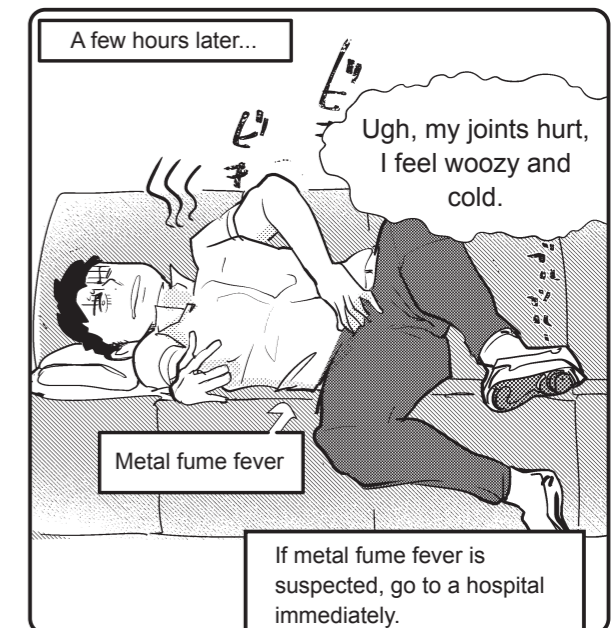


2 Watch out for electric shock!



- Make sure to use safety devices before starting your work.
- Learn about any risk of electric shock and how to respond to emergencies.
- Be careful as you could get an electric shock from damp or sweaty clothing.
- Connect the welding cable properly.

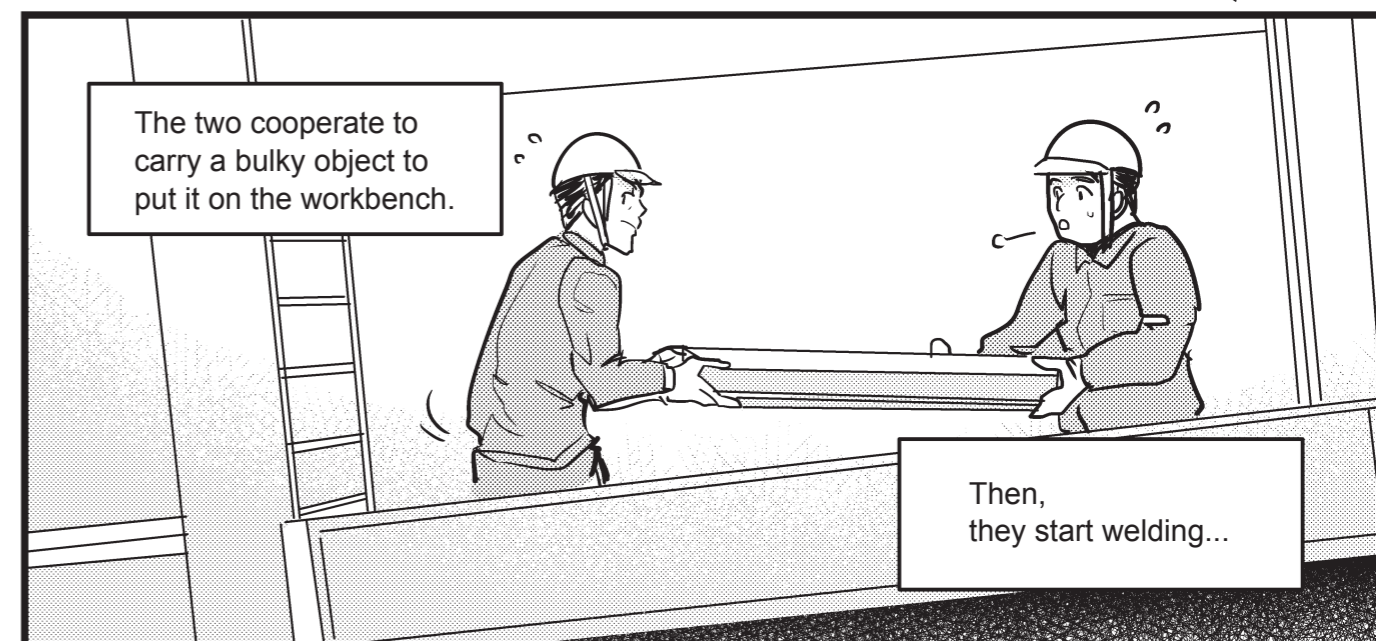
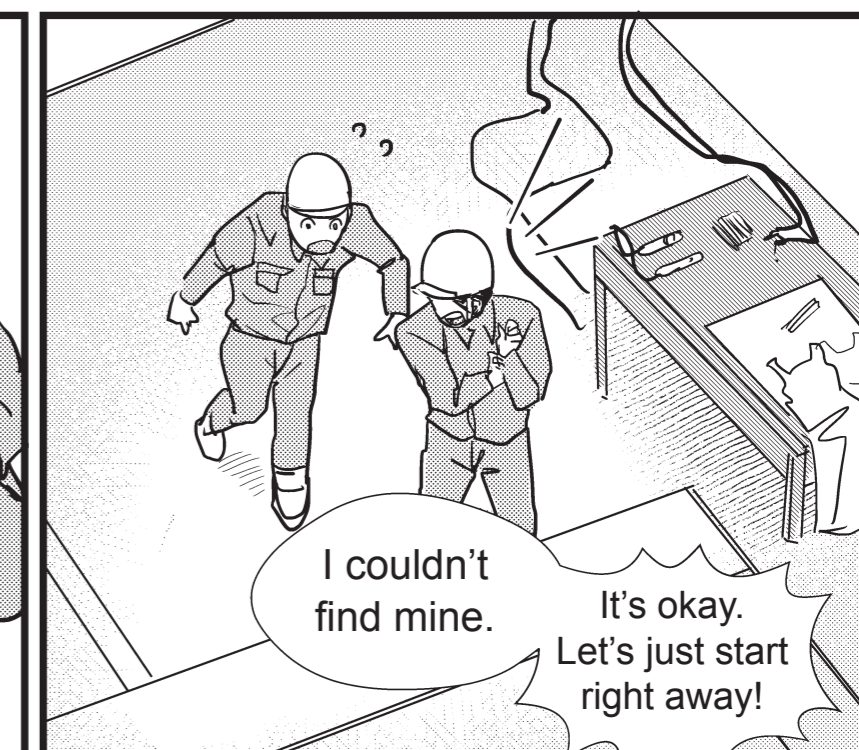
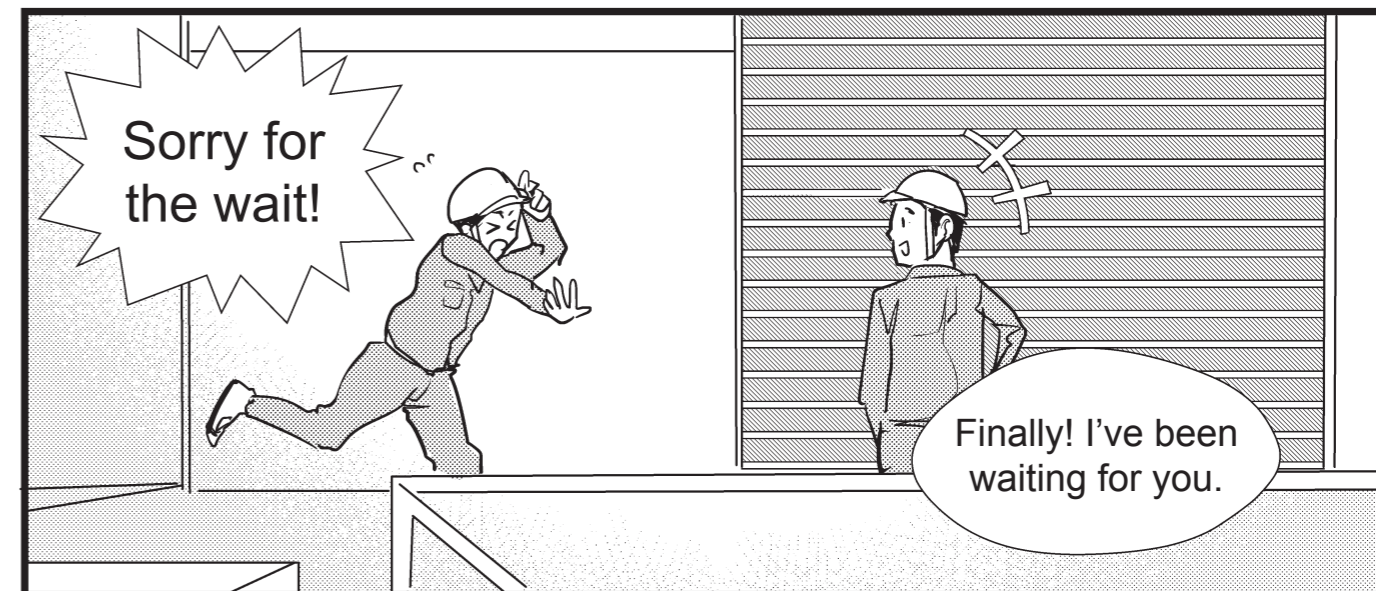
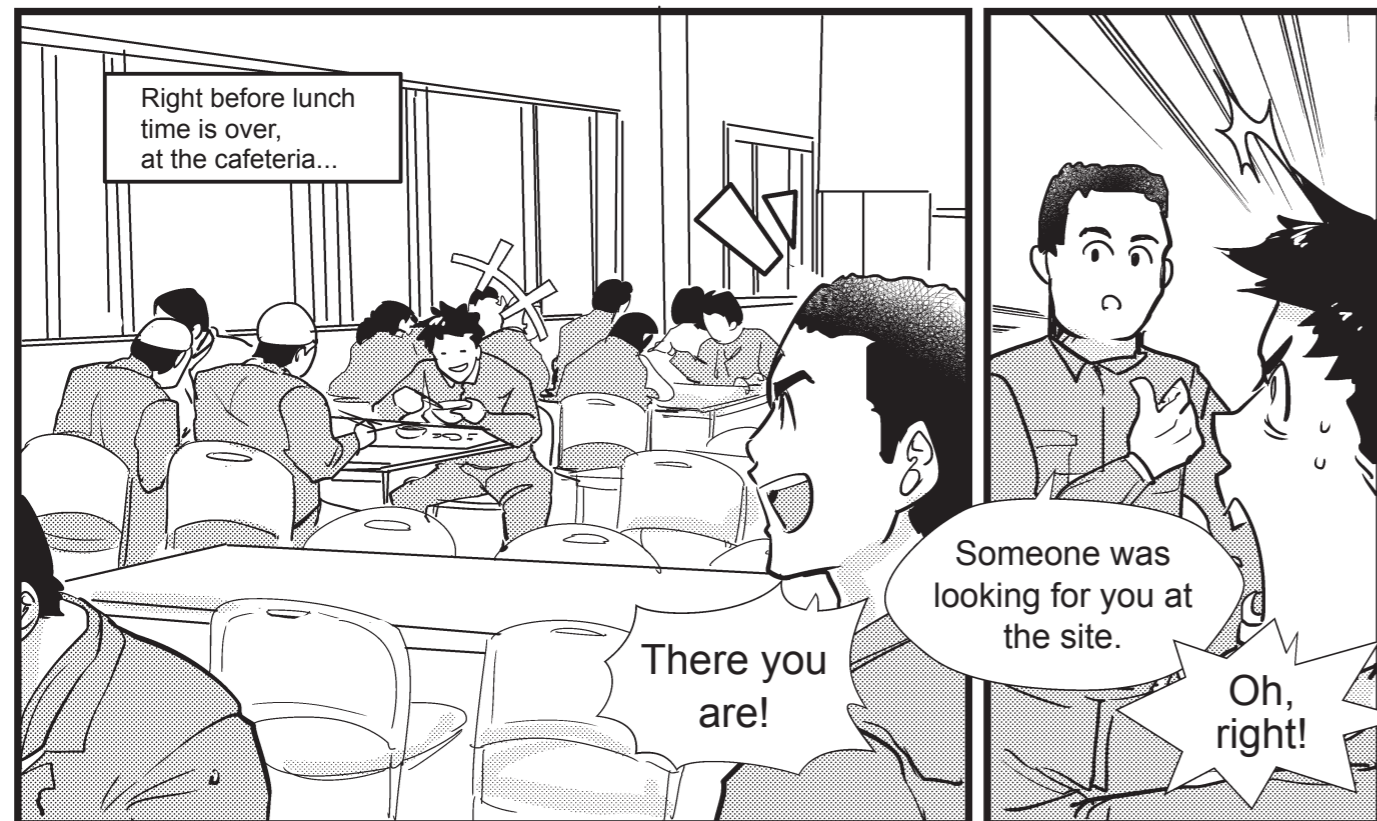
TIPS Watch out for fumes!

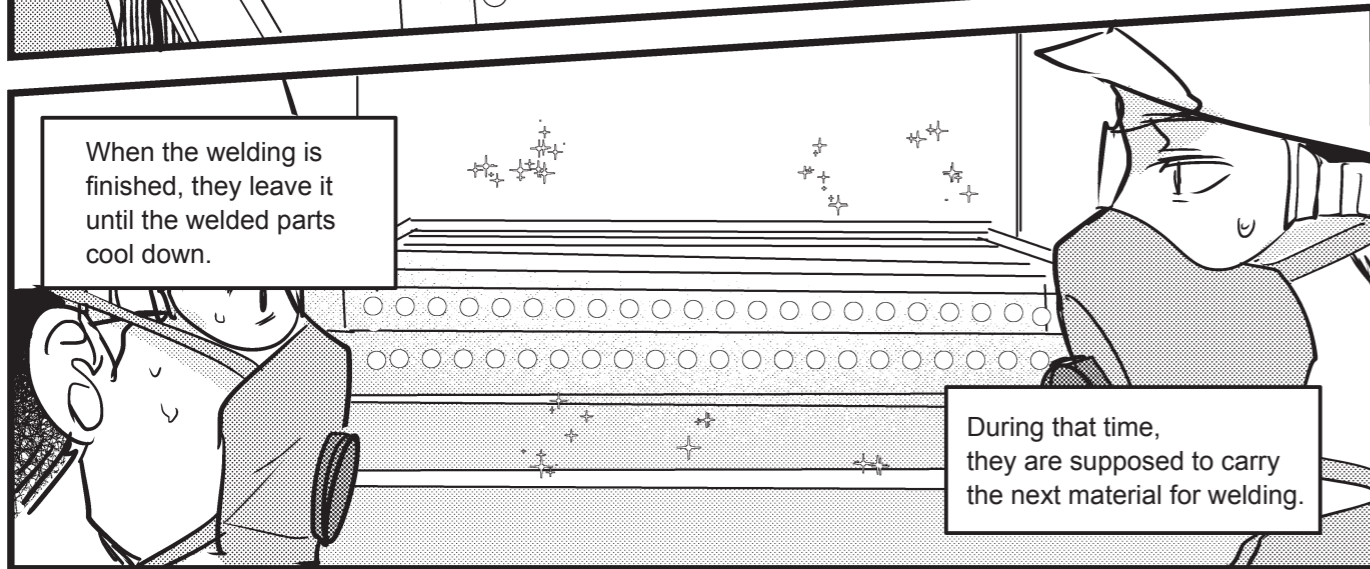
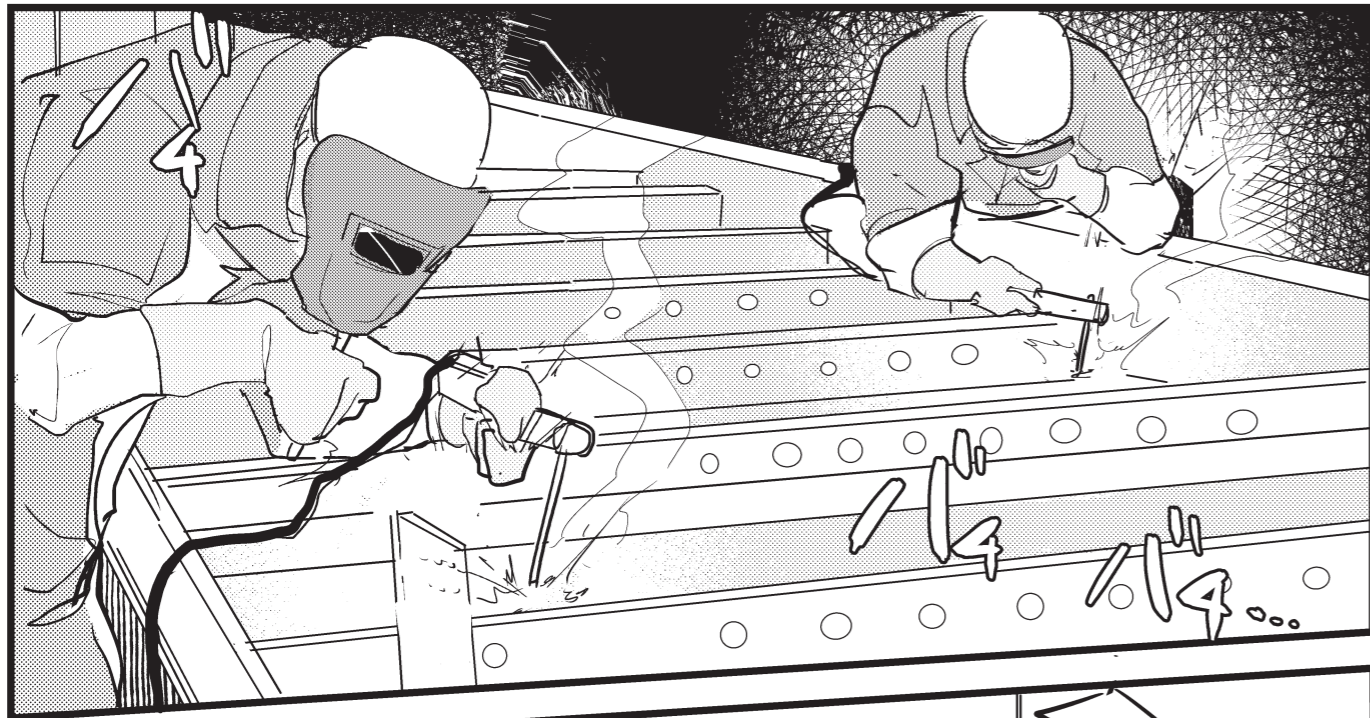


* Metal fume fever is a condition in which the sufferer has symptoms such as a headache, fever, chills, muscle aches, nausea, thirst, and fatigue, from inhaling metal fumes.

Case 2

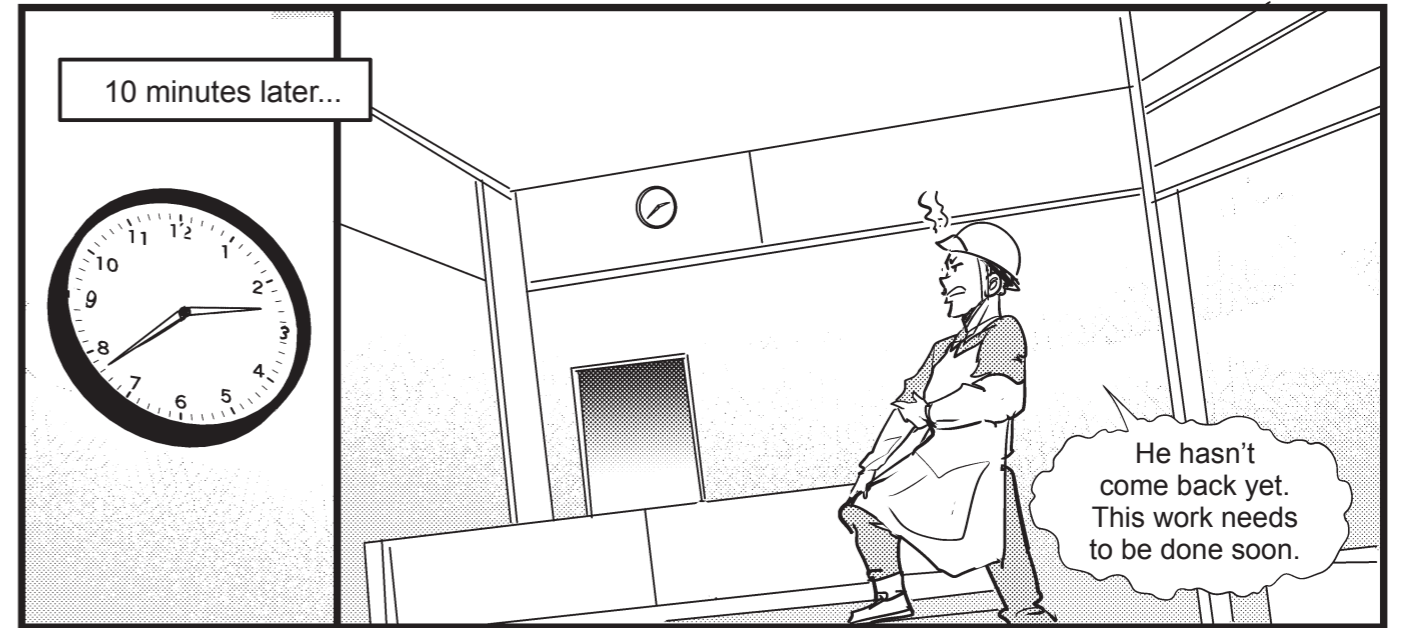
Watch out for moving / falling objects





When the welding is finished, they leave it until the welded parts cool down.

During that time, they are supposed to carry the next material for welding.



10 minutes later...

He hasn't come back yet. This work needs to be done soon.



Materials storage

I might be able to carry it on my own.

Let's just try lifting one up, just to try.



Okay! Let's go get the next material.

Hang on, my stomach just started rumbling all of a sudden.

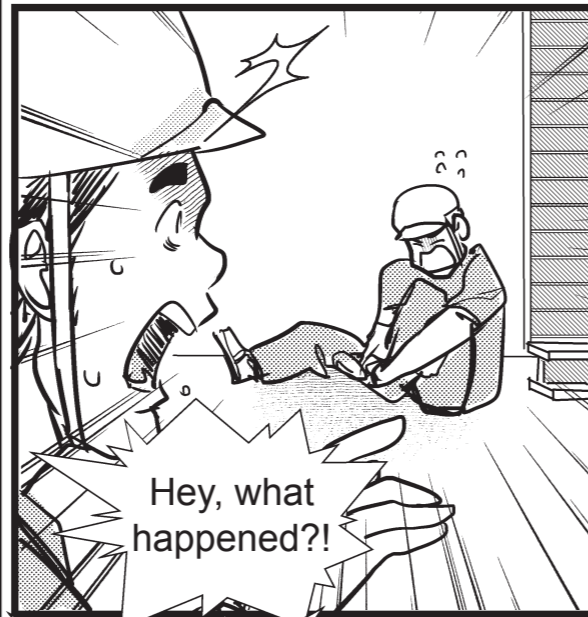
I have to go to the bathroom! I'll be right back, so wait for me!



Humph!

Whoa! This is super heavy!

There is no way...



Hey, what happened?!



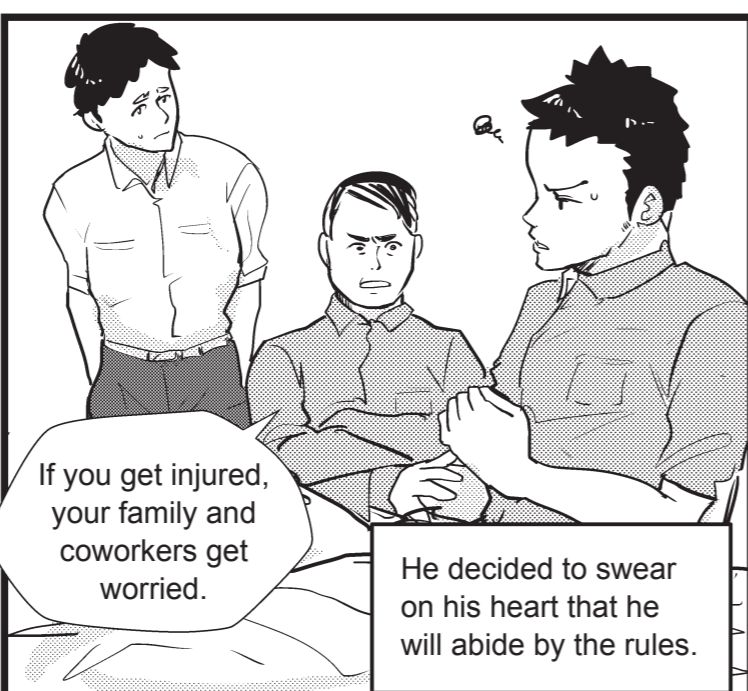
It fell on my foot!

Let's go to a hospital right away!



So I heard you have a broken foot and it takes two months to heal? If you had worn your safety shoes, you wouldn't have had such a serious injury.

Now I understand very well that following the rules is an important thing to do.



If you get injured, your family and coworkers get worried.

He decided to swear on his heart that he will abide by the rules.

Case 2 summary

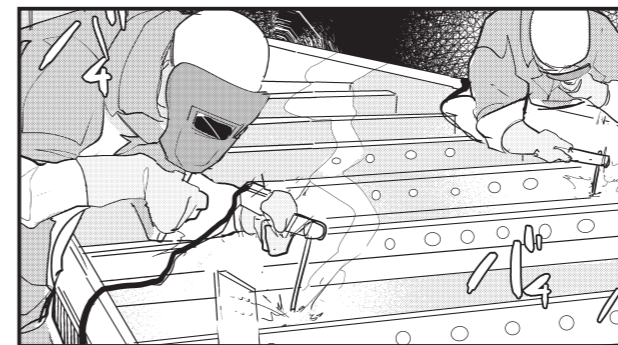
1

Follow the specified procedures when moving materials!



The two cooperate to carry a bulky object to put it on the workbench.

Then, they start welding...



Do not do work that requires two people on your own.

2

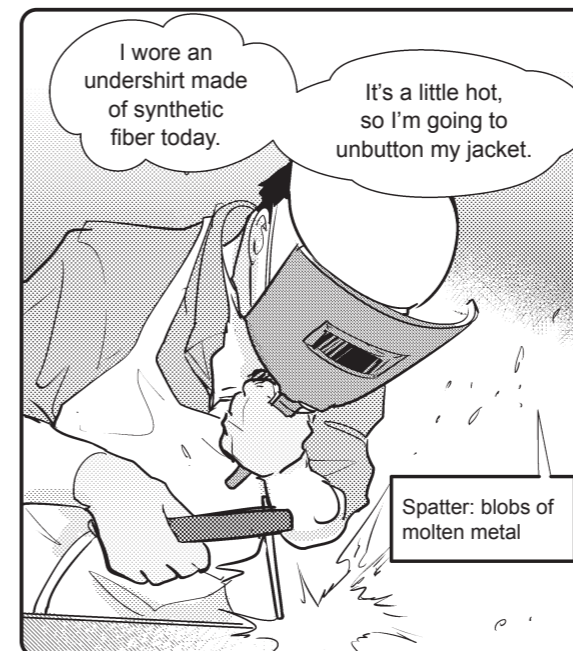
Wear safety shoes when you work!



Safety shoes have a toe cap, so your toes will be protected.

TIPS

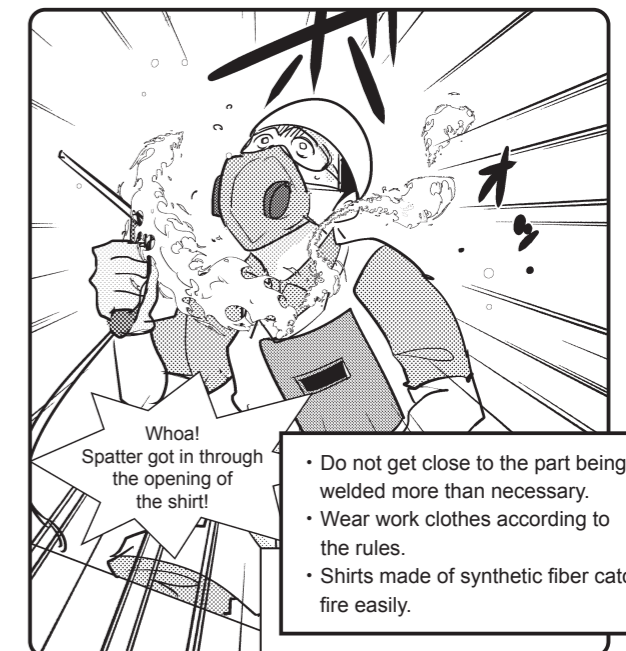
Wear cotton undergarments! Do not wear clothes made of synthetic fiber, which catch fire more easily!



I wore an undershirt made of synthetic fiber today.

It's a little hot, so I'm going to unbutton my jacket.

Spatter: blobs of molten metal

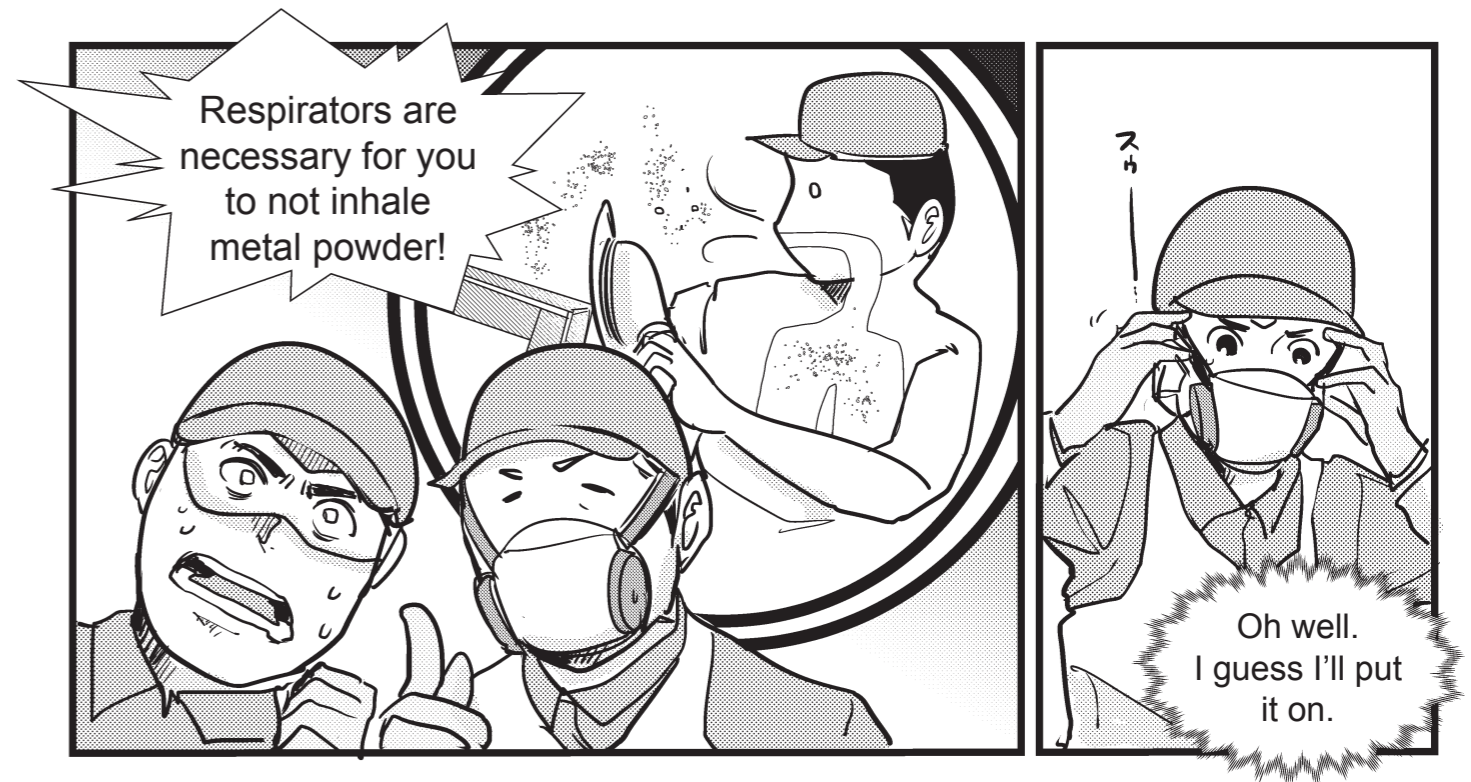
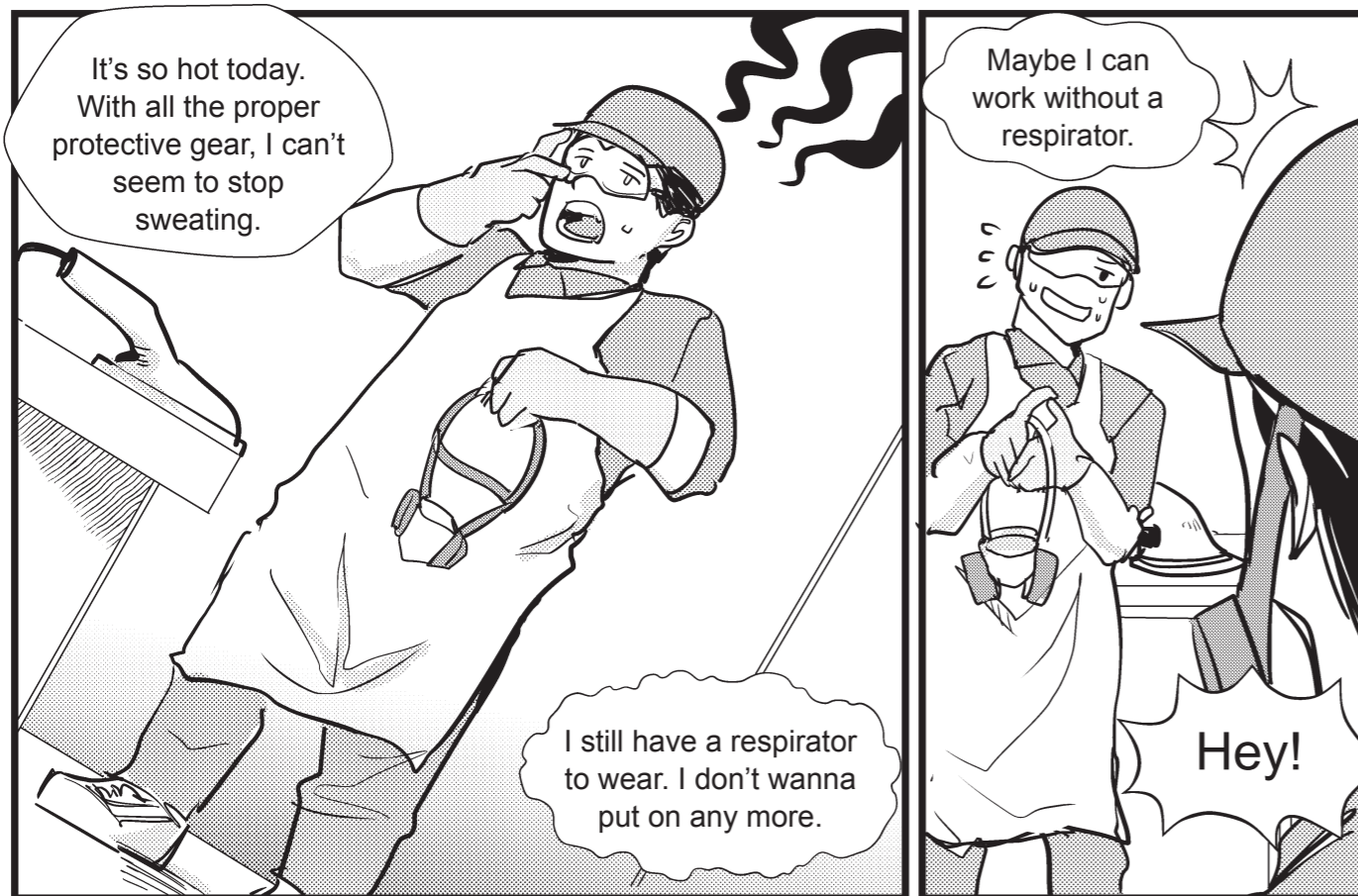
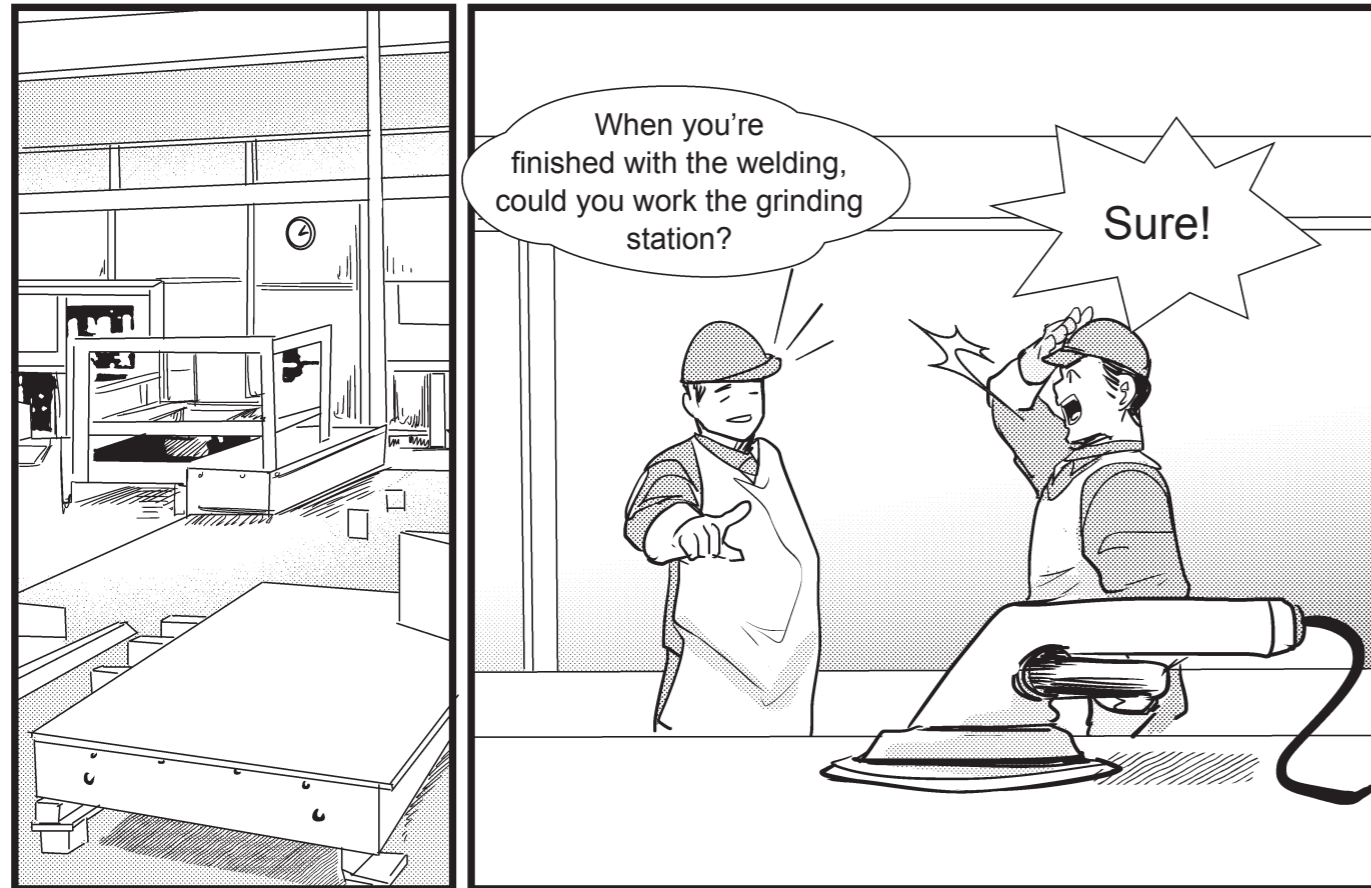


Whoa! Spatter got in through the opening of the shirt!

- Do not get close to the part being welded more than necessary.
- Wear work clothes according to the rules.
- Shirts made of synthetic fiber catch fire easily.

Case 3

Protect your eyes





It's so hot today.
I can't stop sweating.

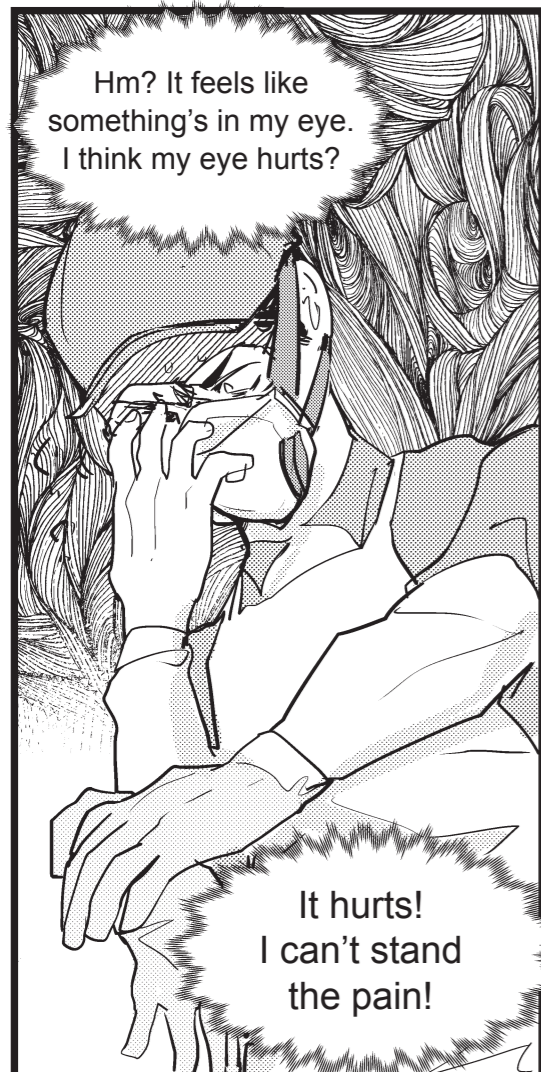


Sweat got into my eye!
Maybe my protective goggles moved a little?



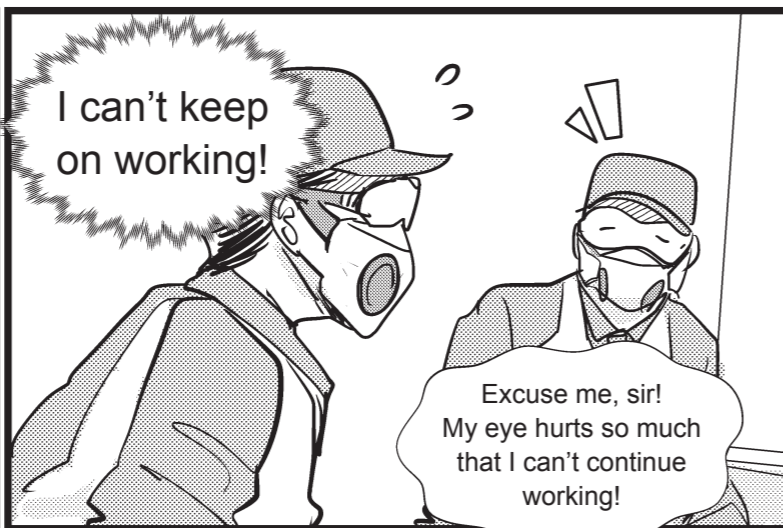
I can't stop crying!

Your eye is bloodshot!



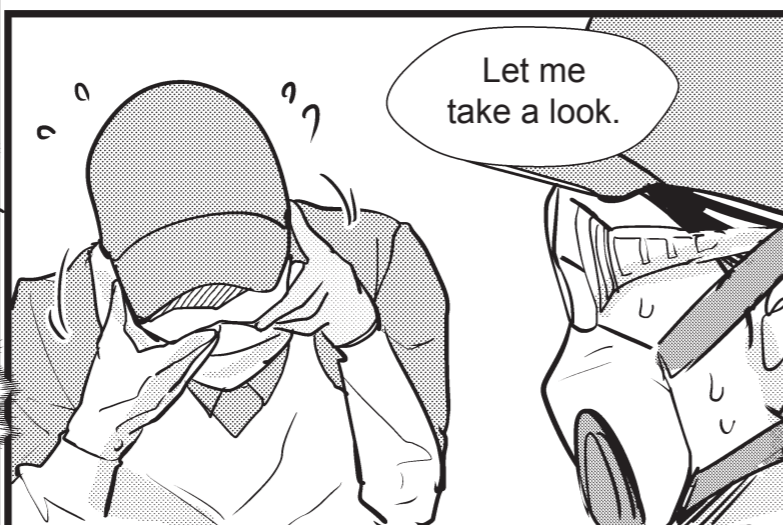
Hm? It feels like something's in my eye.
I think my eye hurts?

It hurts!
I can't stand the pain!



I can't keep on working!

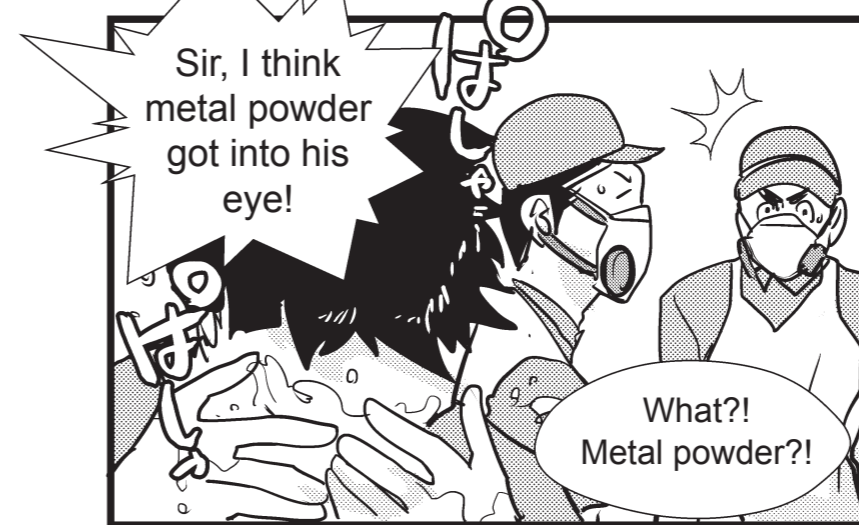
Excuse me, sir!
My eye hurts so much that I can't continue working!



Let me take a look.

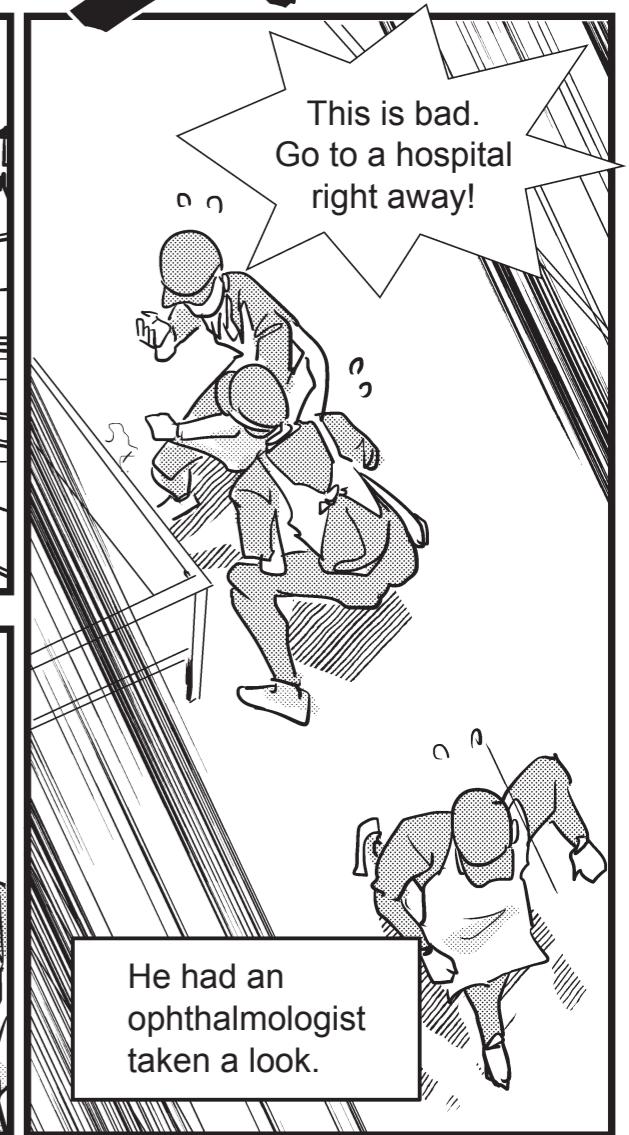


Rinse your eyes immediately!



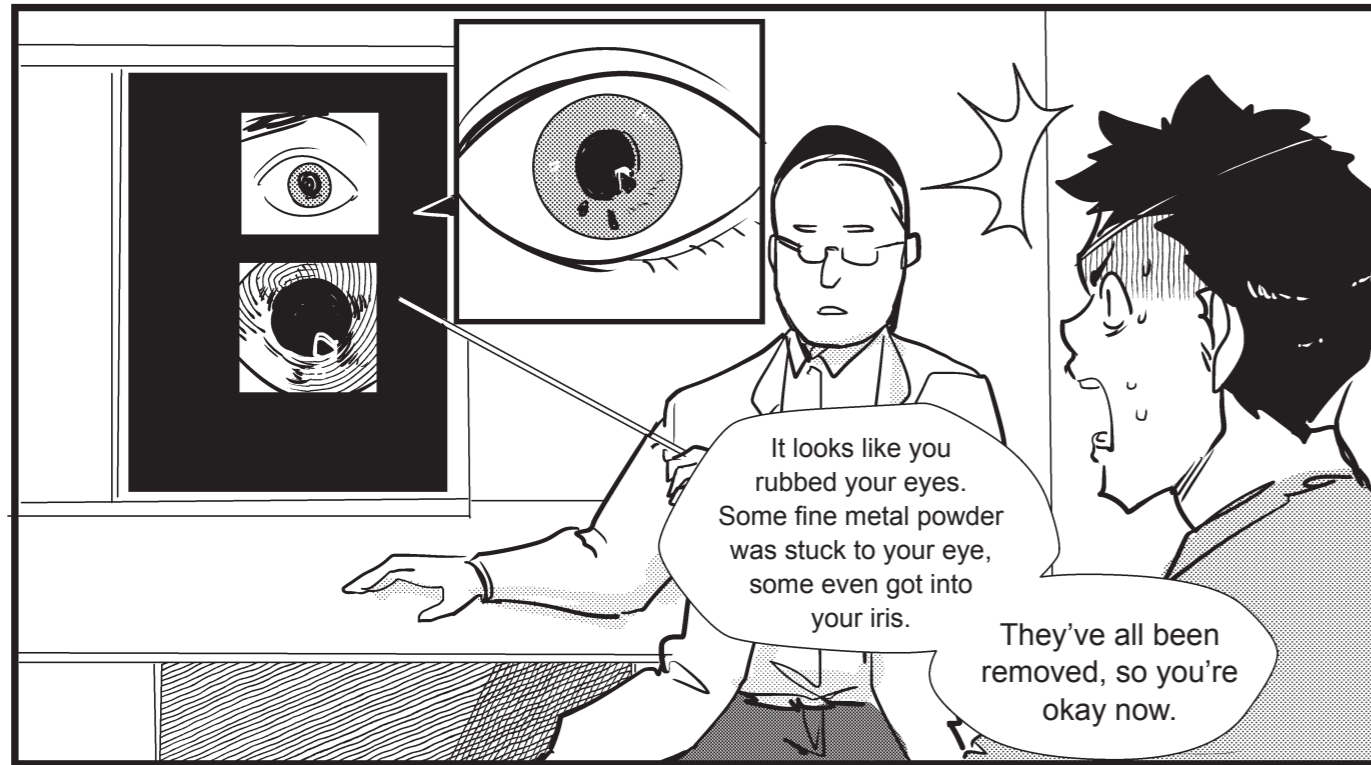
Sir, I think metal powder got into his eye!

What?!
Metal powder?!



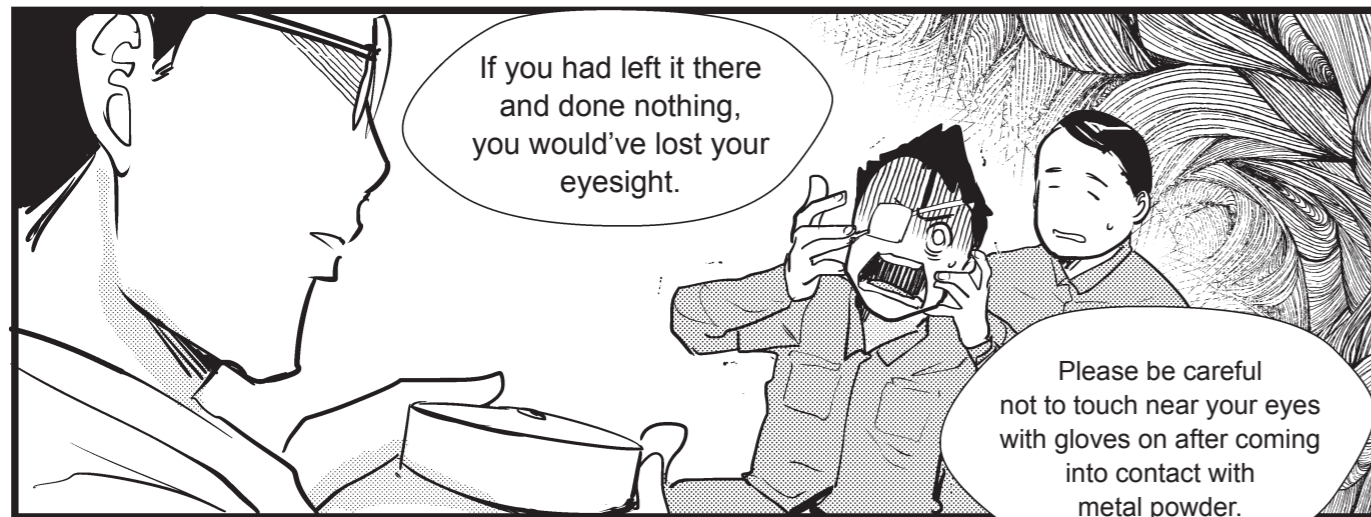
This is bad.
Go to a hospital right away!

He had an ophthalmologist taken a look.



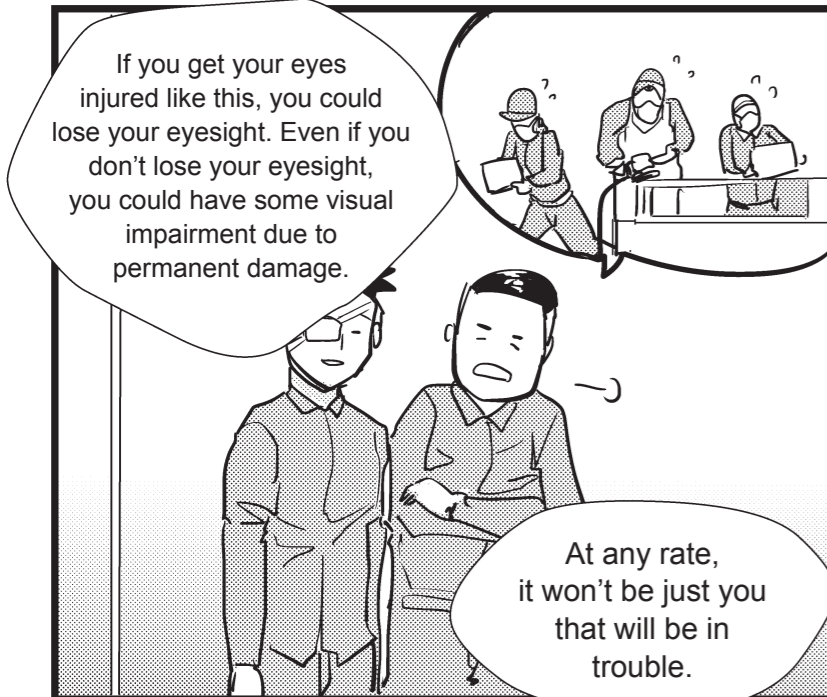
It looks like you rubbed your eyes. Some fine metal powder was stuck to your eye, some even got into your iris.

They've all been removed, so you're okay now.



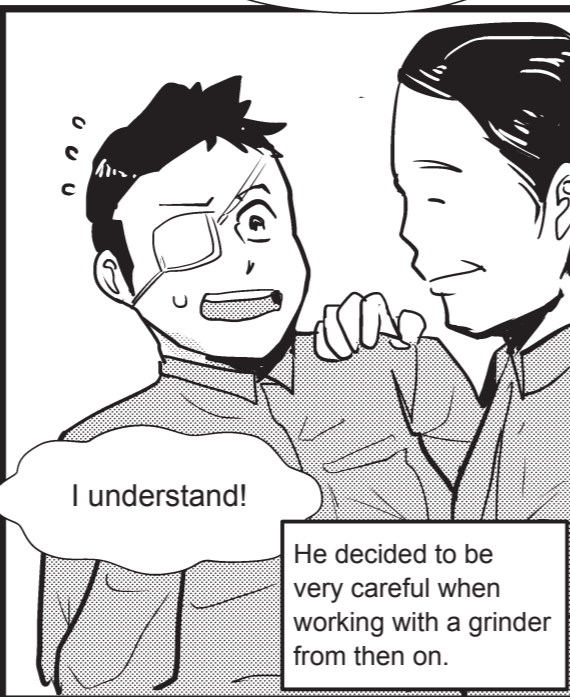
If you had left it there and done nothing, you would've lost your eyesight.

Please be careful not to touch near your eyes with gloves on after coming into contact with metal powder.



If you get your eyes injured like this, you could lose your eyesight. Even if you don't lose your eyesight, you could have some visual impairment due to permanent damage.

At any rate, it won't be just you that will be in trouble.



I understand!

He decided to be very careful when working with a grinder from then on.

Case 3 summary

1 Do not touch near your eyes with gloves on that have come in contact with metal powder.



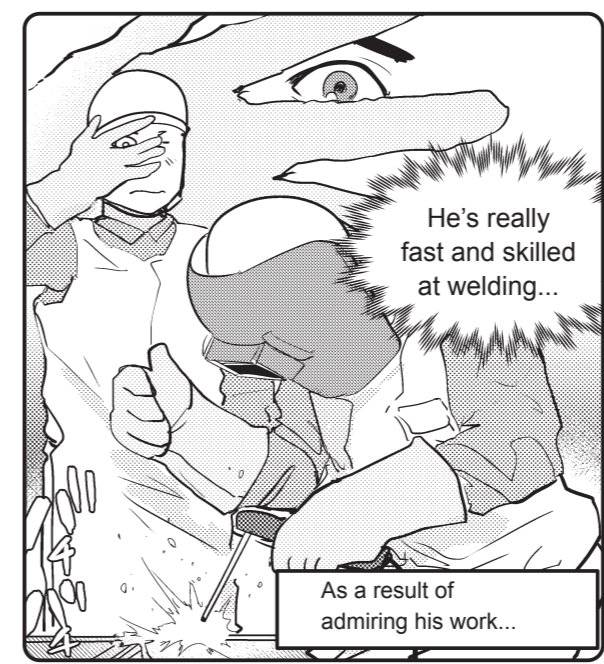
Wash your hands after your work, and take off the dirty gloves when you wipe your sweat.

2 When metal powder or chips get into your eyes, immediately rinse your eyes with running water.



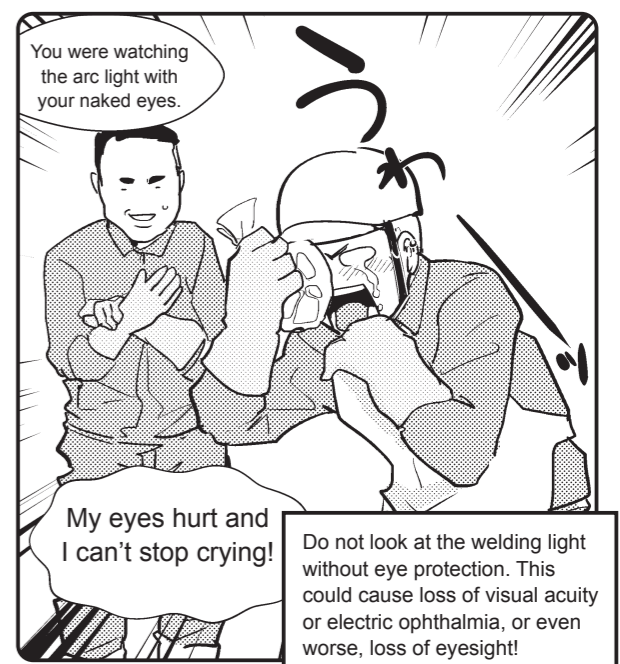
If the pain continues even after rinsing, go see an ophthalmologist. If there are any abrasions or debris in the eye and they are not treated, you could lose your eyesight.

TIPS Do not look at the welding arc without eye protection!



He's really fast and skilled at welding...

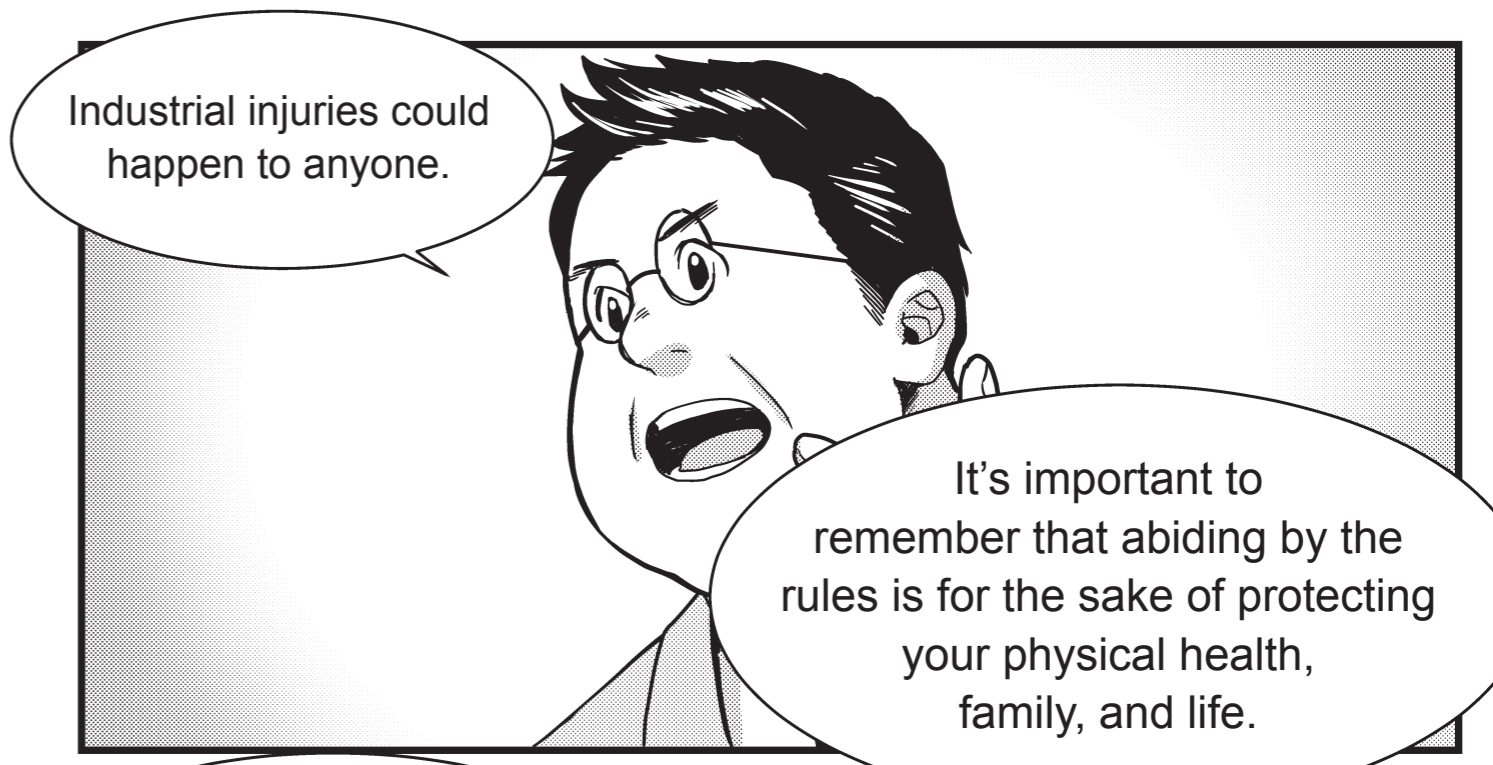
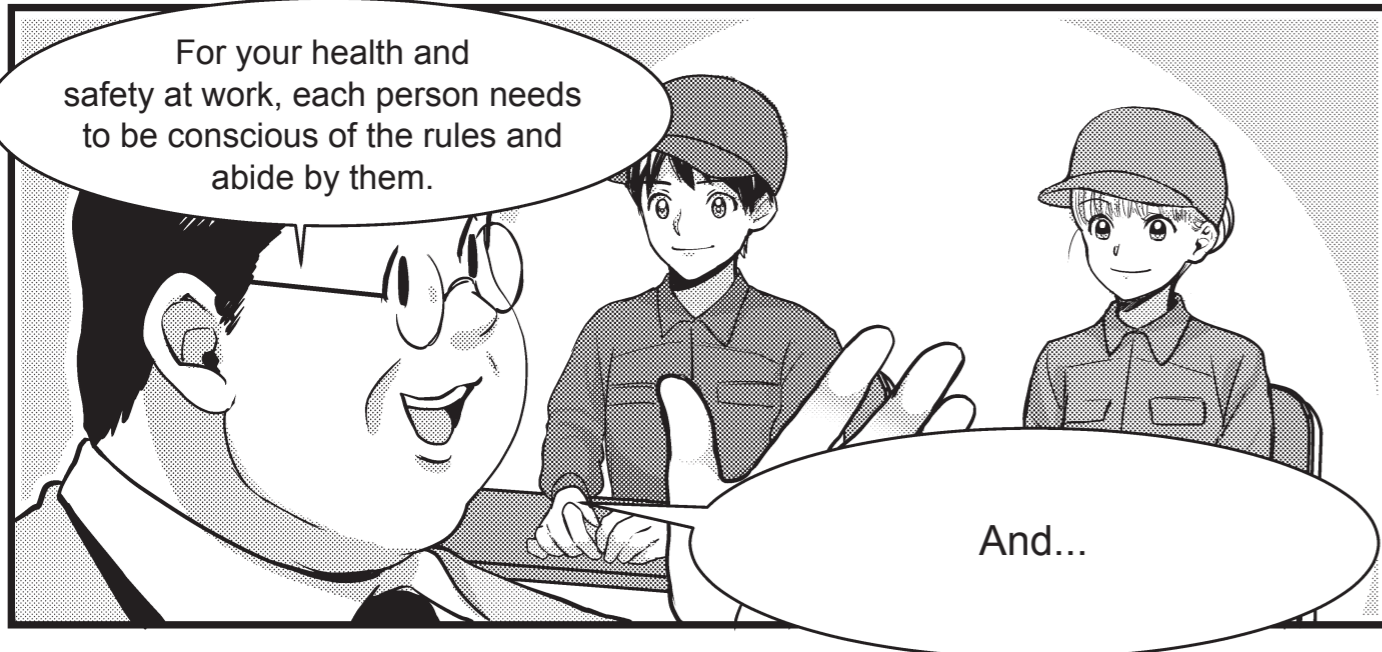
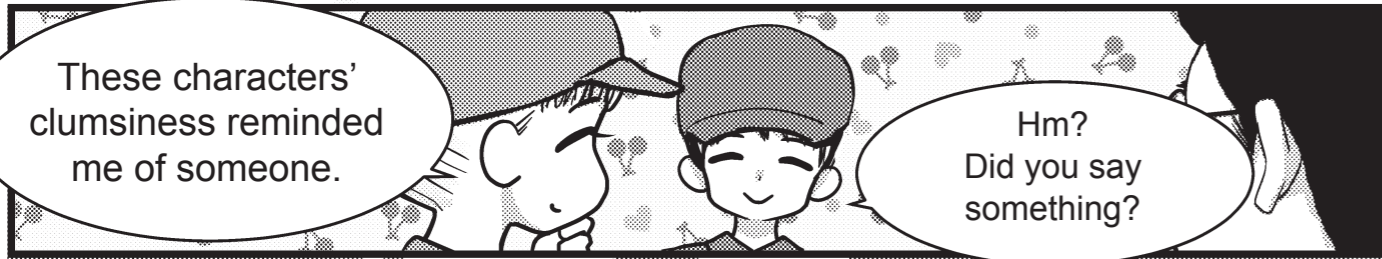
As a result of admiring his work...



You were watching the arc light with your naked eyes.

My eyes hurt and I can't stop crying!

Do not look at the welding light without eye protection. This could cause loss of visual acuity or electric ophthalmia, or even worse, loss of eyesight!



Now you understand that danger can be everywhere.

Industrial injuries could happen to anyone.

It's important to remember that abiding by the rules is for the sake of protecting your physical health, family, and life.

These characters' clumsiness reminded me of someone.

Hm? Did you say something?

Daily communication at a workplace is also important in case something happens.

For your health and safety at work, each person needs to be conscious of the rules and abide by them.

And...

Okay! I'll follow the rules and work hard every day!

Protective gear

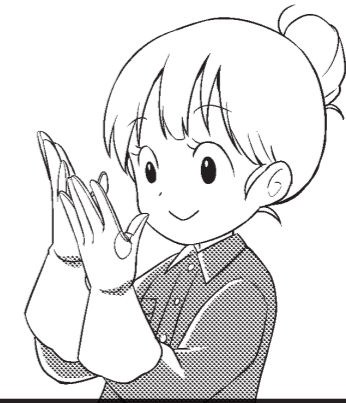
If the protective gear doesn't fit you or is damaged somehow, talk to your supervisor.



Gloves

Gloves protect your hands from heat and sharp objects.

Use leather gloves with long sleeves for welding.



Helmets

A helmet protects your head from impact.

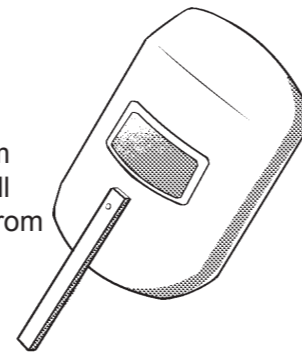
Adjust the chin strap and fasten it so that the helmet will not move around. If a helmet takes an impact even once, replace it.



Welding face shields

A welding face shield protects your eyes from harmful arc light as well as preventing spatter from hitting your face.

Use one that fits your task.



Safety shoes

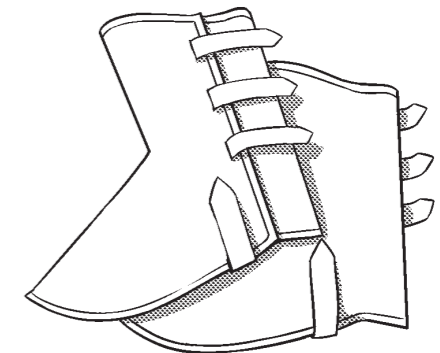
Safety shoes protect your feet from heavy objects.



Wear safety shoes that match your size.

Leg guards

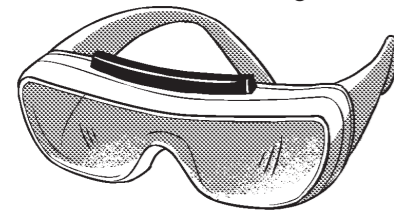
Leg guards prevent spatter from getting in.



Wear them tightly fitted.

Safety goggles

Safety goggles protect your eyes from harmful arc light.



Make sure that they fit your face perfectly.

Protective goggles

Protective goggles protect your eyes from flying objects, powder dust, and heat.

Make sure they are correctly rated for the hazards you will encounter.



Respiratory protective gear

Respiratory protective gear prevents pneumoconiosis.

Respirators (anti-dust)

A respirator (anti-dust) prevents powder dust from being inhaled.

Powered air-purifying respirators (PAPR)

A powered air-purifying respirator has higher protection performance than a respirator (anti-dust), and supplies the purified air through the filter using an electric fan.



- Choose a proper respirator
 - MHLW-approved respirator
 - Fits your face
 - Choose one appropriate for the task
- Perform a fit check
- Inspect it before starting your work
 - Exhaust valve, dirt on the face mask, deformation
 - Clogging of the filter
 - Deterioration of straps

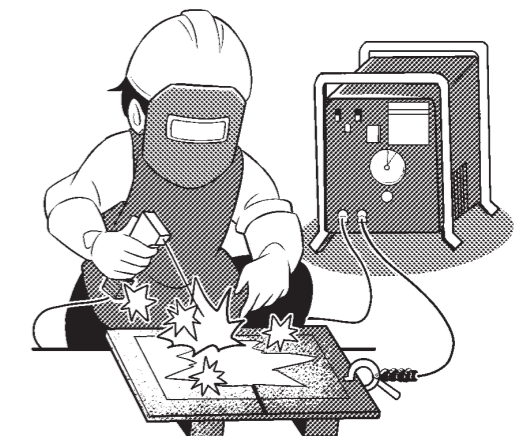
Aprons

An apron protects your body from heat and spatter.

Wear it so that it completely covers your chest.



Automatic voltage reduction devices for AC arc welding machines



A device to prevent electric shock. When working with an AC arc welding machine (shielded metal arc welding), if you're instructed to use this device, make sure to do so.

Learn through Manga

Health and Safety for Welding

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