

Chow: Nobody's here. Oh, it's science class today.

Teacher: Hello class. Summer break is over.
Did you go to any fun places?
Do you still remember what I mentioned about the importance of IAQ before the holiday?

Students: IAQ... What's that?

Teacher: Never mind. Today is going to be IAQ review time.
Who can tell me what IAQ means?
So, Ching Chow, please answer.

Student: Indoor Air Quality. Indoor Air Quality!

Teacher: Student Ching Chow, please answer it. What's IAQ?

Chow: I.A.Q. is... I have a question.

Teacher: Sit down, please.
Alright. Let's review what I.A.Q. means.
I.A.Q. stands for Indoor Air Quality.
That means we're going to explore the topic of indoor air quality today.
What does indoor air quality mean?
How important is indoor air quality to us all?
I want you to try and calculate in one day where we spend most of our time. It's at your home, in school, in the office, shopping malls, and at the indoor sports complex as well.
Have you ever noticed that we spend over 70% of our time indoors?
That means the air we breathe is mainly indoor air.
So maintaining good indoor air quality is important.
If the air quality is poor or contaminated, it will affect our good health.
It will cause headaches, itchy eyes, skin irritation, fatigue, nausea, even respiratory difficulties. However, if the indoor air quality is good, we will feel comfortable.
That means we can work and learn more attentively.

Student B: Hey, Mr. Lam, it was reported in the news that furniture and house furnishings are emitting carcinogens and odor, so I'm wondering if, well, maybe, that has something to do with

indoor air quality?

Chow:

That's right. I found out after we got new carpet.
My allergic rhinitis has become worse, and I keep sneezing.
Plus, I have skin irritation.
Does that have anything to do with it?

Student B:

For me, I'm always coughing.
Does it have something to do with my problem, too?

Students:

Yeah, me too.

Teacher:

Okay, okay. One by one.
It seems you're all interested in the subject of indoor air quality.
Let me show you an example
of indoor air quality in the household. Afterwards,
I believe you'll have to answer the questions you've raised.

Husband:

Honey, come and see this. This table is great.
It's really big and a nice color. It's ideal for all three of us.

Wife:

We're not three anymore. We're four now.

Husband:

Alright. Well, besides the table,
we're going to need a sofa as well.
Let's check them out.

Wife:

Alright.

Husband:

Alright. This sofa looks nice. It's really big.
Wow. And the material feels comfortable. Let's buy it. Excuse me

Salesperson:

Yes, hello, sir. How can I help you today?

Husband:

I want this.

Wife:

Hold on. Honey, don't get too anxious.
Whenever we purchase furniture, besides the size, appearance,
and, of course, comfort of it,
we should also pay attention to its materials and components.

Husband:

So what's it made of? It's simply made of leather, cloth,
some nails, and just some wood.

Wife:

No, honey, we should find out that
if the furniture emits formaldehyde or other chemicals.

Husband:

What's that? Formaldehyde? Is that bad?

Salesperson:

Let me explain it to you.

Formaldehyde is a colorless gas which has a pungent odor.
It's a common type of indoor contaminant.

The main sources of formaldehyde are pressed wood products.
During the first few months after production, products of
plywood and other pressed woods
will emit a high density of formaldehyde. Later, the emission of
formaldehyde will slow down,
but the emission period is relatively long, so it may take several
years.

Husband:

Oh, I see.

Then, what are the harms of formaldehyde to humans?

Wife:

Hey, I know the answer to this.

Even a low density of formaldehyde in the air
can cause irritation to the eyes, the nose, and even the throat.
It can trigger allergic rhinitis and coughing.

Skin that's been in contact with formaldehyde may show allergic
reactions.

A high density of formaldehyde can even be the cause of nausea
and shortness of breath.

It has been categorized as a carcinogen
by the International Agency for Research on Cancer.

So when purchasing furniture, formaldehyde should never be
overlooked.

Salesperson:

Wow, ma'am, you really know a lot about this.

I think I might lose my job.

Wife:

You're too funny, but I'm no expert.

Salesperson:

In that case, why don't you take a look at this environmentally
friendly furniture?

It's made of low formaldehyde pressed wood.

They have a source record, so they're trustworthy.

Husband:

So, honey, why don't you make the decision?

Wife:

I think this shop is very honest in what they say.

I think that sofa will go well. Let's buy this one, honey.

Husband:

All right, it's up to you. Okay, we'll take this one.

Husband:

Yes, thank you, sir. Please go and pay at the cashier,
and I'll help to arrange delivery for you later.

Husband: All right, thank you.

Wife: Hey, honey, when the furniture's delivered to our new home, we'll have to open the windows and leave the furniture to sit there for a few days before we move into the flat.

Husband: Why do we have to leave the new furniture to sit there for a few days?
Don't you want to move in as soon as we can?

Wife: Don't you realize that all new furniture is bound to have at least some contaminants?
So we must make sure that they are in a well-ventilated place for a few days so that the formaldehyde can be dispersed.
It'll be beneficial to our health and, of course, that of our baby's.

Husband: Ah, you're really very thoughtful, dear.

Wife: I have to be.
You want our precious daughter and the baby we're expecting to live in a healthy and comfortable environment, don't you, dear?

Husband: Of course I do.

Child A: This is going to be our new home now.

Wife: Yes. What do you think? Like it?

Child A: Of course, I like it.

Husband: Watch out, don't get in the way of the workers.

Child A: Why isn't there any carpet in here?

Husband: We'll see. We're not having carpet in our new home.

Child A: But why not? Carpet is so comfortable.

Wife: Sweetheart, the climate of Hong Kong is subtropical, humid, and wet, and it rains quite a lot here.
Carpet dampens very easily in a climate like this.
The perfect conditions for the breeding of microorganisms such as mold and dust mites.
Biological contaminants affect indoor air quality and trigger allergies and respiratory diseases.

Child A: Ah!

Husband: Let's go.

Wife: Oh yes, carpets emit VOCs as well.

Husband: VOCs? This name sounds familiar. I think I've heard of it somewhere.

Wife: VOCs is short for Volatile Organic Compounds. They include all types of organic compounds. These organic compounds will volatilize at room temperature. VOCs are emitted from a variety of daily products commonly used, such as paints, adhesives, hairsprays, detergents, and pesticides. A high density of VOCs can cause eyes, nose, and throat irritations. They can even cause headaches and dizziness. So during renovation or when we're purchasing furniture, we should never overlook this.

Husband: Wow, so VOCs are really harmful to us. Well, how can we avoid them when conducting renovation?

Wife: First of all, the renovation work should be carried out when the premises are not being used as much as possible. We should purchase products with low VOCs as much as possible. We should closely study and follow the correct instructions for their use and pay attention to all the warnings on the labels. We should also avoid using these products in closed spaces.

Husband: So then, if we're supposed to carry out everything you've just said now, it's too late.

Wife: Don't worry, honey. I was very well prepared. I asked the workers to pay attention to these aspects before they started. Everything's being done according to the Environmental Protection Department.

Husband: Honey, you're so thoughtful.

Wife: You just now realized this.

Wife: Sweetie, we're going. Honey, let's go.

Teacher : I believe all of you know how to maintain good indoor air quality at home now, right? Let's go a step further and look elsewhere. I know many of you like playing sports. You've been in an indoor sports center, right? Well, have you ever thought about the air quality of indoor sports centers? Actually, when we're playing sports, we release more carbon dioxide than we normally do when we're at rest. The level of carbon dioxide is an indicator of the indoor air quality. So, if there is a high level of carbon dioxide, we will feel sleepy. What's more, it will also affect our health. How about this? Let's check out the experiences of our coach Wong.

Student C: Why am I so tired? It's stuffy here, you think?

Student D: Why do I feel so tired today? I'm exhausted!

Coach Wong: What's going on here? Why is the air so bad? Hmm, what's going on? Oh, I know!

Student C: Hey Mr. Wong, when'd you get here?

Student D: It's strange. I'm feeling really tired today. And a bit dizzy also.

Student E: Same here. Normally one or two hours of training is a piece of cake, but today we're feeling exhausted.

Student C: Are we slipping back?

Student E: Oh no, how can we win now? What should we do?

Coach Wong: Calm down, everyone. The reason you feel dizzy, short of breath, and particularly tired is not because you slipped back. Because, look there. You forgot to turn on the ventilation system. So the indoor air quality has dropped. I believe the carbon dioxide PPMV level is very high here.

Student C: No wonder we feel so tired now. It's the poor indoor air ventilation.

Student D: PPMV is so high? What's PPMV mean?

Coach Wong: PPMV means part per million by volume, for measuring the concentration of carbon dioxide. When we're indoors, we should avoid high levels by keeping the concentration at 1,000 PPMV or lower. If the PPMV is kept at 800 or lower, the air will be healthier and much fresher for us. That means a comfortable environment for us to play sports.

Student E: Oh, I understand. We were too excited to play and forgot to turn on the ventilation system.

Coach Wong: If not well-ventilated, not only carbon dioxide, but also radon that's being emitted will accumulate. That affects health, too.

Student D: Radon? What is radon?

Coach Wong: Radon is a kind of colorless, tasteless, and odorless radioactive gas from radiolysis of radium in soil, in rocks, and even in structures that we build. Natural radon disperses from walls, from floors, and even through cracks in the ground and into the interior of buildings. You see, in poorly ventilated buildings, radon will stay and accumulate, affecting the indoor air quality. And it is because of this that radioactive particles are released during the decaying process of radon. But if inhaled, the radioactive particles will accumulate in our lungs and affect our health negatively. Also, if a high density of radon is mixed with cigarette smoke and then inhaled, it will bring serious harm to your health.

Student C: There's so much to learn about keeping good ventilation indoors.

Coach Wong: To maintain good indoor air quality, the ventilation system is very important. When doing exercises indoors, make sure there's sufficient fresh air supply. Also, normal operation of the ventilation system.

The person in charge of the stadium should inspect the systems and clean and maintain them regularly.
If we're working out in a stadium and it's stuffy, we should report it to the person who is in charge of the stadium and ask for follow-up actions.

Student D:

Got it. So we should stay aware of it at all times and make sure the indoor air quality is good.
It may even help enhance our basketball performance.

Student C:

That's right. We need to pay attention.

Student E:

Wow. After the ventilation system was turned on, the air has become fresher. I don't feel dizzy. Mr. Wong, you're cool.

Coach Wong:

Alright. Break time's over. Let's start practicing again.
Come on.

Teacher:

So you know what IAQ is by now, don't you?
In order to improve the quality of the indoor air we breathe and raise the public's awareness of it, the government has launched a voluntary air quality certification scheme.
Let me share our story with you about what this is all about.
This will show you how it's implemented.

Mr Tam:

Alright. Here. This is a good place. Go and have fun. I'll take a rest here.
Don't go too far away.

Child B:

Okay.

Mr. Tam:

Hey, Mr. Li, do you remember me?

Mr. Li:

Mr. Tam, what a coincidence. You've moved in here?

Mr. Tam:

And you've happened to transfer your job here, too.

Mr. Li:

That's right, last month. My position is Environment Manager.

Mr. Tam:

Environment Manager? That sounds like quite an interesting position.
So then, what things does the job entail?

Mr. Li:

I'll be happy to sit and tell you.

Mr. Tam:

Please.

Mr. Li:

Well...My main duty is to maintain a quality environment in this clubhouse. This involves assessing and monitoring the indoor air quality of the clubhouse, as there are quite a lot of elderly and children. Good indoor air quality is very important to everyone's health. So our clubhouse management made the decision and joined the Indoor Air Quality Certification Scheme for offices and public areas. We hope to further enhance the indoor air quality of the clubhouse.

Mr Tam:

The Indoor Air Quality Certification Scheme? What exactly is that?

Mr Li:

The certification scheme was launched by the Environmental Protection Department. The scheme's aim is to raise the indoor air quality of all offices and public areas to a better level and encourage the owners and property managers to continue to strive to reach the highest indoor air quality possible. We have put great effort into improving the indoor air quality of our clubhouse. Ever since we joined the scheme, we've invited inspectors to come for walk-through inspections to inspect the indoor air quality. Then we've made adjustments according to their suggestions, like improving the ventilation system, intensifying the cleaning of the air conditioning filters. We also collect air samples for measurements and laboratory tests. The results show that we have reached the good level of standard. We hope to raise our standard to the excellent level.

Mr Tam:

No wonder I feel that the indoor air quality of this clubhouse is exceptionally fresh and uncontaminated. Exceptionally good. When I played with my granddaughter just now, I felt the air was well circulated and I could breathe smoothly. It wasn't stuffy at all. What a good job you're doing here.

Mr Li:

All indoor areas of offices and public areas that have mechanical ventilation and air conditioning systems called MVAC are welcome to join the certification scheme.

After the indoor air quality is tested and is found compliant to the indoor air quality objectives, the certificate issuing bodies will issue a certificate for the management company. That then can be registered at the Indoor Air Quality Information Center. The endorsed certification can be displayed at a prominent location for public information. Ever since we joined the certification scheme, air quality has improved. Our clubhouse has become more comfortable. Even our staff's work efficiency has been raised. And more people have come to enjoy their time here.

Mr Tam:

The air quality in here is really quite good. I should come here with my granddaughter to let her play more often. Look at that. She's having sweet dreams.

Mr Li:

That's because the air quality is good here.

Teacher:

All right, class, I believe you all understand the importance of IAQ. We should pay more attention to the air quality of our homes, shopping malls, and the like. We should also make sure it's good in the classroom. If you have any questions, go ahead. Want more detailed information? Check information posted in the Indoor Air Quality Information Center. All right, time is running short. Everybody, you may take a break, except Ching Chow. That's right, you were late today. Come to me after school.