



Hello. I'm Margot Politis. Welcome to Study English, IELTS preparation.

Today we're going to learn about lasers – what are they, and how they work.

We'll also practice structuring a description of how something works, and we'll work on our vocabulary for describing colours.

Let's begin by listening to Imogen Jubb talk about the history and the science of lasers.

Lasers are used in all sorts of settings like welding, cutting, surgery, communications, reading bar codes at the supermarket or reading the information stored on a CD or DVD.



There are many types of lasers but they all have 3 main parts to them. They all have an energy source, such as a lamp, some sort of feedback mechanism, like this pair of mirrors, and also some medium, like the ruby crystal, which can amplify the light.

Now the first laser was built in the 1960s. It was made from a ruby crystal, some lamps and 2 mirrors, one on either side of the crystal.

I've got a sort of model of it here.

The lamp shines white light onto the crystal, which is represented by this tube. Pumping energy into the crystal actually gives off light at a particular frequency to produce a particular colour.



Some of this light bounces backwards and forwards between the two mirrors, and passes through the crystal each time.

Each time the light goes through the crystal, it gets amplified, stimulating the same energy release in other parts of the crystal. So after many times in between the two mirrors, and many reflections passing through the crystal, you end up with a very strong, narrow beam of light that is just one colour.

One of the mirrors is only partially reflective, so some light passes out as the laser beam.

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Before Imogen explains the laser to us, she starts with an 'introduction', or 'orientation'.

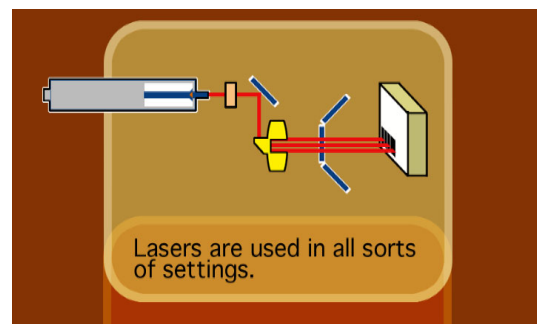
That way, we know what to focus on.

If you're describing a device or a tool, it's a good idea to introduce it by naming it and describing what it's used for.

This is useful in spoken English, and it's also a good way to begin if you are writing in formal English.

Listen to how Imogen introduces the laser.

Lasers are used in all sorts of settings like welding, cutting, surgery, communications, reading bar codes at the supermarket or reading the information stored on a CD or DVD.



She talks about the function of the laser and lists a few of the things we use lasers for today.

In formal writing, if you were to introduce a discussion of lasers, you could structure your opening paragraph in a few ways.

One idea would be to start like this:

"A laser is a device designed to intensify a beam of light."

Or, you might choose to write:

"The diagram is of a laser designed to scan barcodes."

But Imogen chooses to begin by telling us what lasers are used for.

She begins:

"Lasers are used in all sorts of settings".

In your introduction, you could give some background about the device.

Once the device has been introduced, you can talk about it in more detail.

Let's listen to Imogen describe the parts of the laser. How many parts are there and what are they?

There are many types of lasers but they all have 3 main parts to them. They all have an energy source, such as a lamp, some sort of feedback mechanism, like this pair of mirrors, and also some medium, like the ruby crystal, which can amplify the light.

She talks about three main parts.

All lasers have: ‘an energy source’, ‘a feedback mechanism’, and ‘a medium to amplify light’.

In formal writing, we could structure this information in a number of ways.

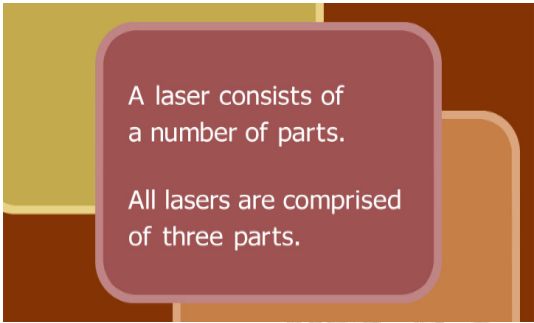
We might say that:

“A laser consists of a number of parts.”

Or:

“All lasers are comprised of three parts.”

Both of these sentences are structured to include a *subject*, a *verb*, and an *object*.



You would then follow with a list or another sentence detailing exactly what the three parts are, in order:

“These are the energy source, the feedback mechanism and, finally, a medium to amplify the light.”

Imogen then explains how each part of the device functions. Let’s listen as she describes each part.

The lamp shines white light onto the crystal, which is represented by this tube. Pumping energy into the crystal actually gives off light at a particular frequency to produce a particular colour.

Some of this light bounces backwards and forwards between the two mirrors, and passes through the crystal each time.

Each time the light goes through the crystal, it gets amplified, stimulating the same energy release in other parts of the crystal.

So you can see how Imogen has built up a clear image of the device.

In formal written English, you might finish off by explaining the ‘purpose’ of the device.

You could say:

“The purpose of the laser is to generate an intense beam of light.”

Let's hear how Imogen finishes her description.

So after many times in between the two mirrors, and many reflections passing through the crystal, you end up with a very strong, narrow beam of light that is just one colour.

She finishes by talking about what the purpose of the laser is, what it produces.

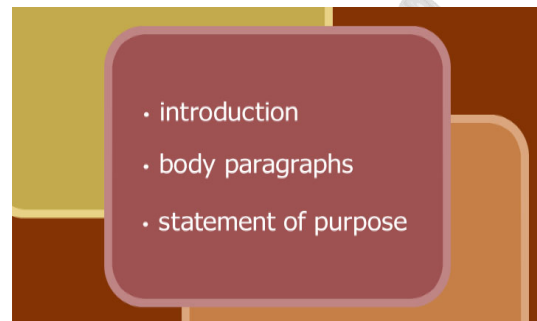
She says:

"You end up with a very strong, narrow beam of light'."

So let's review how Imogen has structured her explanation.

First, there was an 'introduction' to the object. Imogen told us that we were talking about the laser and then gave us some background.

She then moved into the 'body of the description'. She told us that it is made up of three parts, and listed those parts.



In your writing, you might write three separate 'body paragraphs' - one for each of the parts.

Then, you'd finish off with a 'statement of purpose' – what the object's overall purpose is.

Now let's finish by listening to Imogen one more time, and then we're going to talk about colours.

The lamp shines white light onto the crystal, which is represented by this tube. Pumping energy into the crystal actually gives off light at a particular frequency to produce a particular colour.

When energy passes through the crystal, it gives off a particular colour of light. Light contains all the colours of the 'spectrum', or the 'rainbow'.

These are:

'red, orange, yellow, green, blue, indigo, violet'.

We talk about shades of colour in different ways – most commonly by using 'light' and 'dark'.

For example:

'light blue', 'dark blue'.



Or sometimes we refer to nature, for example:

'sky blue',

'forest green'

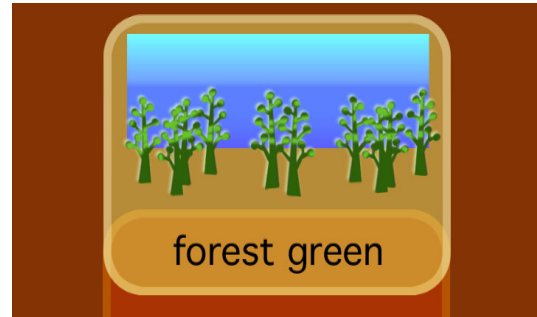
'fiery red'.

We also use precious stones to describe colour. For example:

'sapphire blue'

'emerald green'

'ruby red'.



And that brings us to the end of Study English today.

But for more information on structuring descriptions go to our website. You will find notes, exercises and quizzes to help you.

Just go to abcasiapacific.com/studyenglish.

And I'll see you next time for more IELTS preparation. Bye bye.

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