

So, what's an X-Ray?

X-Rays were first discovered in 1895 by Wilhelm Conrad Röntgen, a professor at Würzburg University in Germany. During an experiment he noticed this 'unknown energy' so called it 'X-radiation'. For this discovery, Röntgen was awarded the very first **Nobel Prize** in Physics, in 1901.

An **X-Ray** is a form of **electromagnetic** radiation with a small **wavelength**; so small that it can't be seen by the human eye. Due to this small wavelength, X-Rays can pass through some solid objects but not all, it depends how dense the object is.

Why does the X-Ray photograph only show bones?

The human body is made up of bones, skin, tissue and muscles. All of these have varying densities but bones are the most **dense**.

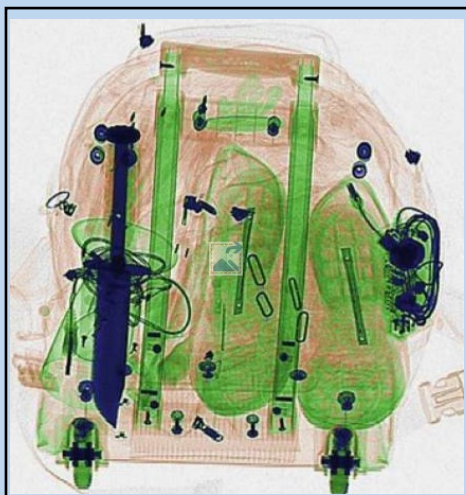
When you pass an x-ray through a body, the bones are the only part through which the x-rays are not able to pass. If you place photographic paper on the other side of your body, only those rays which have passed through the body will turn the paper dark.

This is why bones show up as white spaces on an x-ray and how doctors can tell if you have an injury to your **skeletal** structure.



This image has been coloured red to show where the break in the bone is.

Why can't you wear metal when having an X-Ray?



Metal is very dense so it stops the X-rays getting through and blocks the view of anything behind. This can be very useful when looking at other objects.

This is a **scanner** in an airport. Look at how some objects show up more than others. The material of the bag is less dense so its image is lighter. The knife is hidden in the bag, but not hidden from the X-Ray!

These questions are about 'So, what's an X-Ray?'

Tick true or false

X-Rays can be seen by the human eye.

X-Rays were first discovered by a German professor.

X-Rays can't go through metal very well.

X-Rays show where broken bones are by automatically colouring them red.

T	F

(2)

When were X-Rays first discovered by Professor Röntgen? (1)

Draw lines to match the statements.

X-Rays are a form of

Bones show up

X-Rays have

X-Ray scanners are

small wavelengths.

electromagnetic radiation.

white on a X-Ray.

used in airports.

(2)

These questions are about 'So, what's an X-Ray?'

In what year was Professor Röntgen awarded the Nobel Prize? (1)

In which scientific area did he get this award? (1)

Professor Röntgen discovered X-Rays by accident. What phrase is used to show you this? (1)

What do X-Rays do to photographic paper? (1)

Give three examples of the features of non-fiction texts that are used in this extract. (3)

These questions are about 'So, what's an X-Ray?'

Why are some of the words in **bold** type? (1)

Explain why are X-Ray scanners useful in airports?

Give an example from the text. (2)

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Look at the image from the airport scanner.

Use the information from the text to explain how and why some objects can be seen better than others. (3)

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Why are you asked to remove all metal objects before having an X-Ray? (1)

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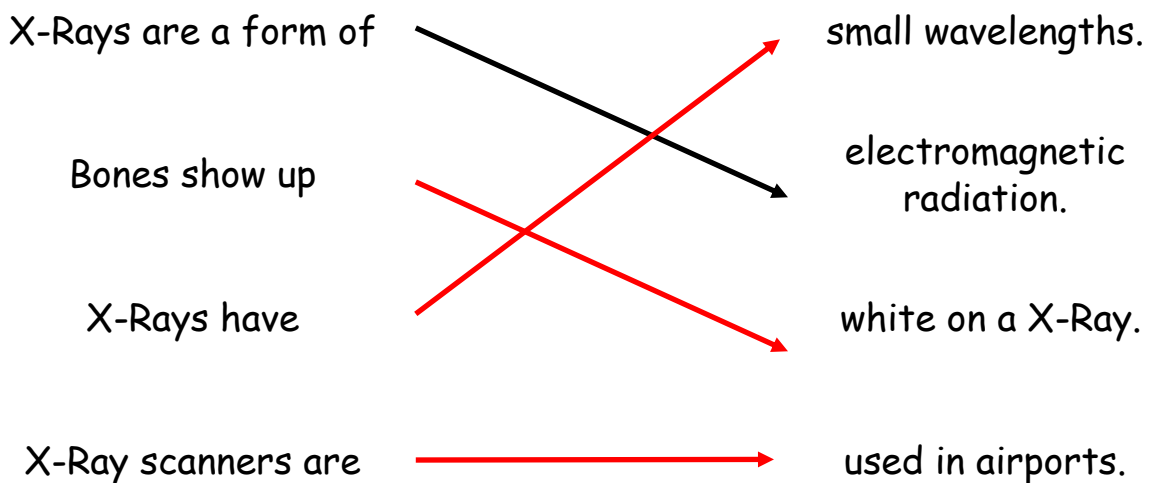
T	F
	✓
✓	
✓	
	✓

(2)

When were X-Rays first discovered by Professor Röntgen? (1)

1895

Draw lines to match the statements.



Two marks for 3 correct answers, 1 mark for 2 correct answers. (2)

These questions are about 'So, what's an X-Ray?'

In what year was Professor Röntgen awarded the Nobel Prize? (1)

1901

In which scientific area did he get this award? (1)

Physics

Professor Röntgen discovered X-Rays by accident. What phrase is used to show you this? (1)

Unknown energy.

What do X-Rays do to photographic paper? (1)

Turn them black.

Give three examples of the features of non-fiction texts that are used in this extract. (3)

Heading/title.

Sub headings/sub titles.

Images/photos/Caption.

Formal tone.

Words in bold - referring to the glossary. Etc.

These questions are about 'So, what's an X-Ray?'

Why are some of the words in **bold** type? (1)

Reference to the glossary.

Help to find the meanings of these unfamiliar words.

Explain why are X-Ray scanners useful in airports?

Give an example from the text. (2)

They help to find hidden objects.

A hidden knife is shown.

Look at the image from the airport scanner.

Use the information from the text to explain how and why some objects can be seen better than others. (3)

Reference to density of the objects.

Reference to how they show up lighter or darker.

Reference to how metal can be seen easily.

Reference to the fact that metal objects look white.

Why are you asked to remove all metal objects before having an X-Ray? (1)

Because X-rays can't go through metal thus hiding any illness, broken bone or dangerous object, etc.
