

X-ray : How do images help to diagnose illness?

In 1895 the discovery of the X-ray was an important milestone in the history of medicine made by Wilhelm Röntgen, Professor of Physics in Bavaria. X-rays became more commonly used to treat soldiers fighting in World War 1, finding bone fractures and imbedded bullets.

In numbers:

1913 Salisbury Infirmary took **248** X-rays
By **1919** they were doing 4 times this with **1073**

X-rays are a form of electromagnetic radiation, similar to light. However, X-rays have higher energy and can pass through objects and in medicine they are used to make images of inside the body.

Many of us will have had an X-ray, commonly at a dentist to look at teeth health or during an examination to check for broken bones.

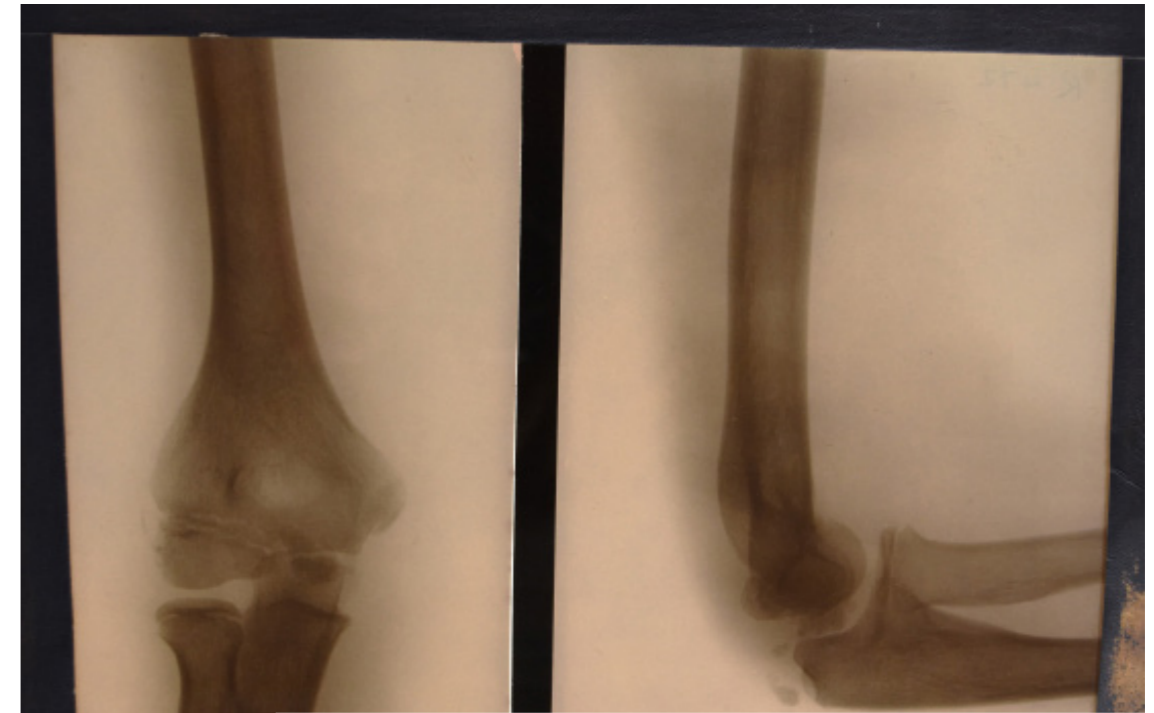
Read more at <https://www.nhs.uk/conditions/x-ray/>

How X-rays work

- X-rays are a type of radiation that pass through the body. They can't be seen and you can't feel them.
- A detector on the other side of the body picks up the X-rays after they've passed through and turns them into an image.
- X-rays find it more difficult to pass through dense parts of your body, such as bone, and these show up as clear white areas. X-rays can pass through more easily softer parts, such as your heart and lungs, and these show up as darker areas on the images.

Early X-rays in Salisbury Hospital's history collection are printed as a negative onto glass plates. (right)

Later they were printed onto film and viewed on a light box (theatre photo)
Today images are viewed as digital files on a computer screen (below)



Did you know?

This advertisement, in the 1930s Salisbury Hospital Carnival programme, says you can have your foot x-rayed to get your shoes fitted. (This was common practice until late 1950s)

A child would try on new shoes, place their foot in the X-ray machine and then parents or the shop keeper could view through a scope, at the top, to see if the toes had enough wiggle room!

You will need:

- tissue paper
- scrap paper, string, dried leaves/grasses* not essential
- laminating pouch & laminator
- sticky tape
- scissors
- hole punch
- pre-cut card mount

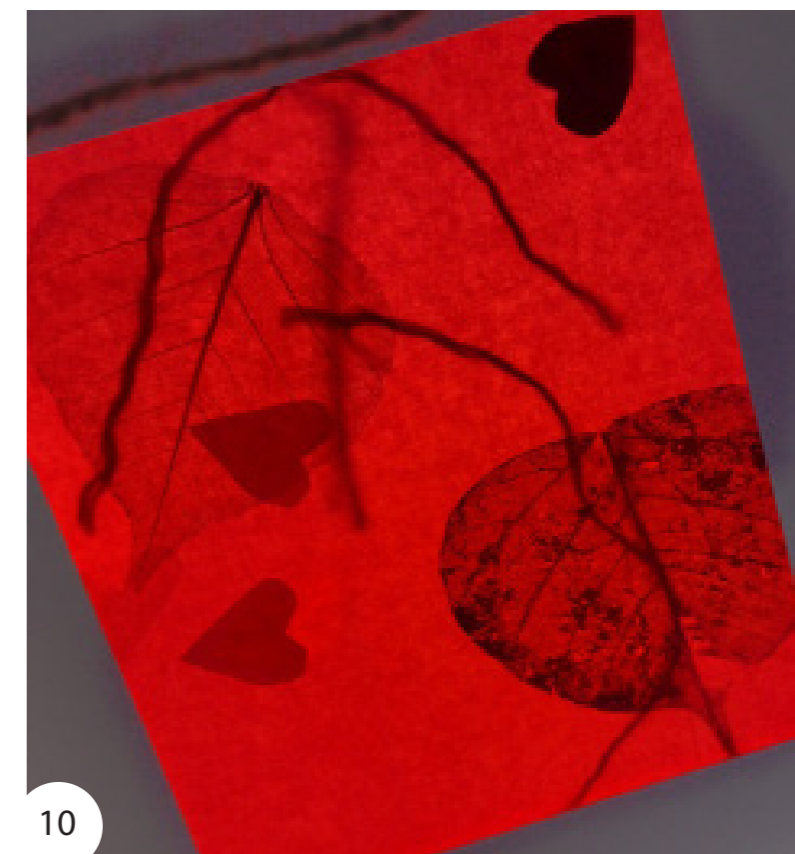
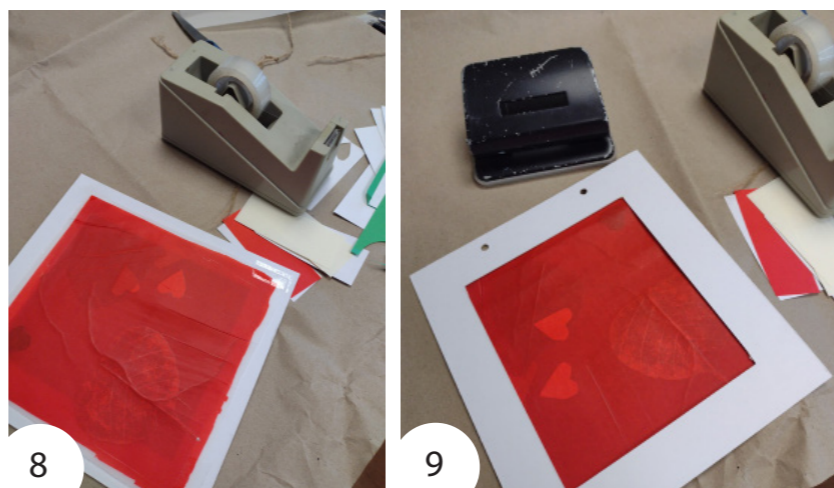
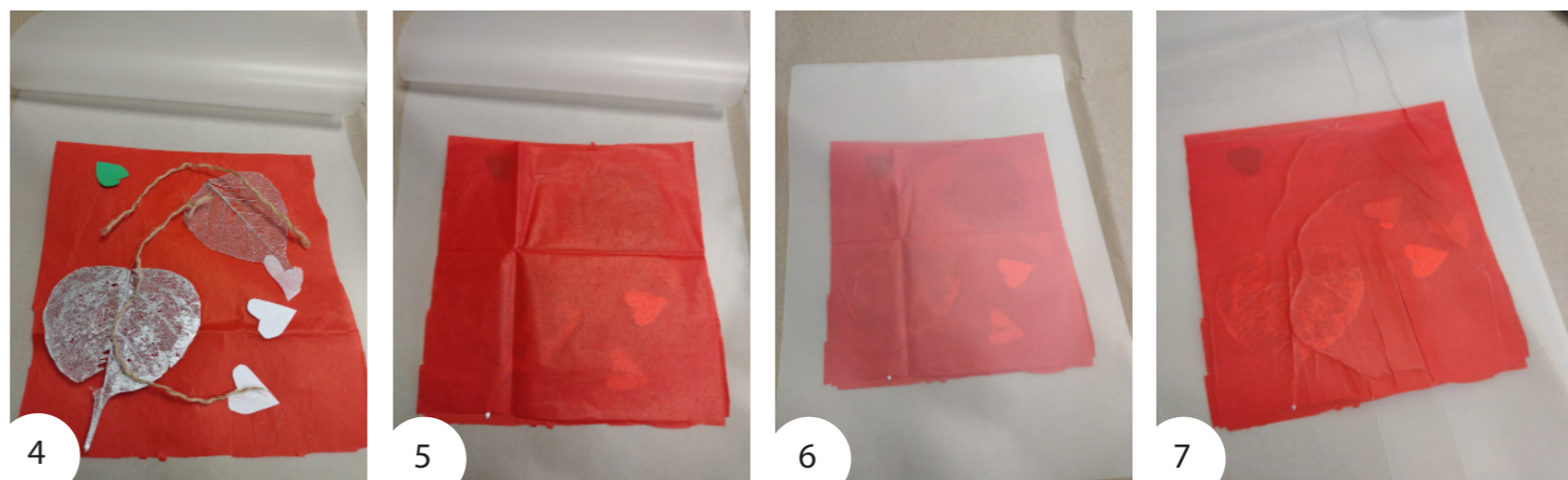
Instructions:

1. Measure 2 pieces of tissue paper that are slightly bigger than the hole of your pre-cut card mount
2. open a laminating pouch
3. place inside your pouch one sheet of tissue paper
4. layout cut out shapes from your scrap materials, string or dried leaves & grasses
5. cover with the second piece of tissue paper
6. close the laminating pouch and run through the machine
7. Once sealed cut out
8. Stick to the back of your cardboard mount
9. Using a hole punch make 2 holes in the top centre of your moun and tie a loose loop of string through the two holes
10. Hang in a sunlit window to reveal your hidden x-ray inspired picture

See how light reveals what is hidden inside your tissue paper artwork. Experiment with different weight papers (such as tracing paper, tissue or thin card) and collage leaves. See how light passes through thinner paper and is blocked by thicker paper or card.

Other ideas and tips:

- If you don't have access to a laminating machine use pva glue to sandwich together your tissue paper and collage layers
- Use a pre-cut window greetings card from a craft shop to send a secret picture





Get handy with calligraphy

This calligraphy artwork by Christine Marr is one of a pair installed in the Radiology Department at Salisbury District Hospital. Created in 1993 Christine uses inks and gouache paint to illustrate the historic developments of X-rays. The central drawing of a hand has been made up with words to look like the bones they represent, as seen on an X-ray.

Phalanges = finger bones

Metacarpals = palm bones

Carpals = wrist bones

Ulna & Radius = arm bones

You will need:

- printed calligraphy sheet (right)
- tracing paper *optional
- ink fountain pen or chisel tip felt pen

Instructions:

Either copy the letters with some tracing paper or try out in the space below.

Other ideas and tips:

- Trace around your own hand and fill in the names of the bones using your calligraphy skills!
- Look up the medical names of other bones in your body - do a group calligraphy drawing by tracing round a whole body on a piece of wallpaper and fill in names of bones that you have researched.
- For smaller children draw around your hand, let them draw in the bones using a white wax crayon or candle and then paint over the top with dark coloured paint for a wax resist picture

a b c d e f g h i j k l m n

a b c d e f g h i j k l m n

o p q r s t u v w x y z

o p q r s t u v w x y z

Cyanotype (or sun print) is a printing process that uses light sensitive ink to create a shadow image onto paper.

You will need:

- Cyanotype paper (also known as sun print paper)
- Grasses, leaves, flowers with interesting shapes. Think about how transparent your objects are. We used some skeleton dry leaves and some wire shaped into flowers.
- Access to water and place for your print to dry
- Sunny day!

Instructions:

1. Place a flower, leaf or grasses onto a sun print sheet of paper
2. Leave for a while (the instructions will suggest timings)
3. Rinse the paper in water and your design is revealed!

Once dried out your print will be really good for making greetings cards, scrapbooks and collages.

Other ideas and tips:

If you don't want to buy sun print paper you can also use cheap sugar paper. Leave on a sunny window sill with some dried leaves or objects (make sure they can't move or blow around) After a few weeks the sun will have faded the exposed paper. The paper beneath the object remains the original colour.

Experiment with different coloured sugar paper. Do some colours fade faster than others?

