

Blueprints!

Job 1

The first job is to make your **light-sensitive** solution.

Get your gloves and goggles on, then follow the instructions.



Eye protection
must be worn

Get two small beakers, a measuring cylinder and a stirring rod.

Weigh 5g of Substance A into one of the beakers.

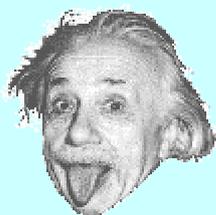
Weigh 9g of Substance B into the other beaker.

Use the measuring cylinder to put 50cm³ of water into each beaker.

Stir carefully until all the crystals in both beakers have dissolved.



IRRITANT



Substance A, the orange-red crystals, is potassium hexacyanoferrate(III).

Substance B, the brown crystals, is ammonium iron(III) citrate.

When you mix them, they become sensitive to light.

Job 2

The second job is to make your photographic paper.

You've got to do this bit in a **DARK** part of the lab.

Mix the two liquids together, and pour them into a tray.

Put a piece of white A4 paper into the liquid just long enough to get it damp – not wet!

Your paper will turn **greenish-blue**. Hang it up to dry it out.

Job 3

The last job is to make your photographs.

You've got to do this bit in a **LIGHT** part of the lab.

Carry your prepared paper and object over to the window.

Place your object on top of the paper, and leave it in the light.

The bits covered by your object will stay **green**, but the exposed bits will turn **blue**.

When you think it has gone **blue** enough, take the object off the paper.

Wash the paper with water – this washes away the **green** bits leaving the **blue** behind.

Leave your photograph to dry out. Wash your hands carefully.

Teacher Guide for Blueprinting

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Activity notes

This stage should be done away from direct sunlight. Two solutions need to be made:

Substance A 5g of potassium hexacyanoferrate(III) (**Irritant** ☒) in 50cm³ of water.

Substance B 9g of ammonium iron(III) citrate in 50cm³ of water. The ammonium iron(III) citrate was tricky to track down, but we eventually obtained it from Sigma Chemicals.

The two solutions should be mixed together and poured into a tray. Plain A4 paper is then floated on the surface (a wide range of papers seem to work, but avoid very shiny papers or very coarse ones). We find that it works best if the tray is gently swirled to cover all the underside of the paper, without prodding it with fingers and pens! The paper should then be hung up to dry in a dark part of the lab, and then left flat in a drawer or lightproof box.

When the students are ready, they should arrange their objects or paper cutouts on the blueprint paper (it must be dry – it doesn't work if the paper is damp). The assembly can then be left in sunlight on a bench to develop. It helps if a sheet of glass is placed onto to keep it all flat (a local glass company, W.D. Rollings Ltd, very kindly sold us A4 off cuts of glass with bevelled edges at a reduced price). After the blue colour develops, the paper is then washed with clean water to remove the undeveloped green colour, and then left to dry. In good light, the blueprint develops within a minute or two giving a sharp image; a very long exposure on dull days produces a shadowy effect due to the movement of the sunlight.

Blueprinting

Students' checklist

Check you have:

- 2 x 150cm³ beakers
- 1 x 100cm³ measuring cylinder
- glass rod
- plastic tray
- A4 plain paper
- wash bottle containing distilled water

Blueprinting

Technicians' notes

For 5 groups of students:

10 x 150cm³ beakers
5 x 100cm³ measuring cylinders
5 x glass rods
5 x plastic trays
5 x wash bottles containing distilled water
Approx. 100 sheets plain A4 paper

On the side bench:

digital balance
potassium hexacyanoferrate(III) – labelled as “Substance A – **Irritant** ☒”
ammonium iron(III) citrate – labelled as “Substance B”
2 x spatulas
drying line with bulldog clips