CREST AWARDS

BRONZE AWARD

REVEALING FINGERPRINTS

10H Typically 10 hours of project work
Recommended for 11-14 year olds

Practical project

Find out which methods are best for revealing latent fingerprints on different types of surface.

#materials
#chemistry
#crime

HOW TO RUN CREST USING THIS ACTIVITY

Looking for some support? Find a mentor by contacting your local STEM Ambassador hub: **www.stem.org.uk/stem-ambassadors/local-stem-ambassador-hubs**

To use their project to achieve a Bronze CREST Award your students will need to:

- **Complete a minimum of 10 hours of project work**
- **Consider the broader impact of their project and demonstrate an innovative approach**
- **Complete the project workbook or short report in another medium**
- **Reflect on their work during the project using a student profile form**

Preparation

Ready to get going with CREST? Sign up for a CREST account here: **www.crestawards.org/sign-in**

Create a new Bronze Award project with the name(s) of the student(s) and the title of their project. If you don't have all the details, you can fill these in later!

Run the project

We have some super handy workbooks and profiles for your students to use when running a CREST Award. You can download these when you create your CREST account by following the link above.

Encourage your students to use the workbook or profile to plan and carry out their project, keeping a record of all their amazing progress.

Make sure you consider safety and risks!

Reflection

So, your students have been hard at work and completed their CREST project, but don't let this be the end of their learning. They should now fill in any remaining sections of their workbook. This is a chance for them to reflect on all the interesting things they've learnt and the invaluable skills they have used.

Enter your project for a Bronze CREST Award

Hard work deserves a reward! Celebrate and certify your students' achievements by entering their project for a Bronze CREST Award. Simply:

Log in to your CREST account at **www.crestawards.org/sign-in**

Select the project and upload a sample of the students' workbooks or other project evidence.

Check the participating students have met each of the criteria on the teacher assessment page.

Finally, complete the delivery and payment details to order your snazzy certificates.

Congratulations on completing CREST Bronze!

What next?

The scientific discovery doesn't need to end here. Students can have a go at the next level up - CREST Silver.

Don't keep all the fun to yourselves, encourage others to take part in CREST projects and share the wonder of science. For free ideas on how to get started, see **www.crestawards.org**

STUDENT BRIEF

Revealing fingerprints

BRONZE AWARD

Fingerprints show up better on some surfaces than on others. A 'latent' print is one that is there, but not clearly visible. The aim of this project is to find out which methods are best for revealing latent fingerprints on different types of surface. You will also need to make a permanent record of the prints, to use as evidence in court for instance.

Getting started

Many factors may affect how well fingerprints show up.

Type of surface:
Test whether fingerprints show up better on smooth surfaces such as glass, crockery or gloss paint, or rougher surfaces such as paper or cloth.

Before you jump to conclusions, think about what might be causing the difference. Consider, for instance, why police take a suspect's fingerprints on a sheet of paper, not on a sheet of glass.

Colour of surface:
Check whether fingerprints show up better on light or dark surfaces.

Does the answer depend on whether the fingers are clean or dirty? For example, with mud, oil/grease or printing ink after reading a newspaper.

Are prints more difficult to see clearly on a patterned surface?

'Lifting' and recording fingerprints:
If revealing fingerprints involves using chemicals, you may need to remove the print from the surface first, to avoid the chemicals damaging the surface. This is called 'lifting'. You could investigate various types of adhesive tape to see which picks up the best impression of the fingerprint from different types of surface. You may need to find a way to 'develop' the print on the sticky surface to make it more visible.

You also need to decide how to make a permanent record of the fingerprints. This needs to be portable, and as clear and detailed as possible, for use in court.

When you have decided the best methods of collecting fingerprints check the effectiveness of your methods by holding a short 'trial'.

You will need:

- A record of a fingerprint taken from a surface.
- An ink fingerprint taken from a 'suspect'. The prints may or may not be from the same finger. If different they should be of the same type (arch, loop or whorl), and similar enough that the answer is not obvious.
- An independent judge (or jury).
- A prosecutor, who has to convince the judge that the 'lifted' fingerprint is the same as the one from the 'suspect'.
- A defence council, who has to show that the prints are not the same.

Things to think about

Lighting affects visibility so make sure your tests are done under similar levels of daylight or artificial light.

Fingerprints on a surface consist of liquids secreted by the body. Touching a surface leaves a pattern of liquid, corresponding to the ridges on the fingers – just like using a rubber stamp. So, what happens to the fingerprints as the liquid dries?

Investigate whether fresh fingerprints show up better than old ones. If so, how long do they take to fade? A few hours, days or weeks? Does it depend on whether the surface is porous?

Forensic scientists 'dust' surfaces to make fingerprints show up better. Try various powders to see which reveal prints most effectively. Check whether the answer depends on the type and/or colour of the surface.

Iodine vapour can also be used to reveal latent fingerprints. You could try this, but be careful what you expose to iodine – it may permanently stain some surfaces.

STUDENT BRIEF

BRONZE AWARD

Health and safety

Science project work is both dynamic and exciting but can also carry some risk. To avoid any accidents, make sure you stick to the following health and safety guidelines before getting started:

- find out if any of the materials, equipment or methods are hazardous;
- assess the risks (think about what could go wrong and how serious it might be);
- decide what you need to do to reduce any risks (such as wearing personal protective equipment, knowing how to deal with emergencies and so on);
- make sure your teacher agrees with your plan and risk assessment.

Iodine is HARMFUL - avoid skin contact.

Some powders and chemicals used to reveal fingerprints may be hazardous. Make sure you complete a risk assessment before you start your investigation.

Remember!

Science isn't just about data. The most successful projects will demonstrate good communication skills and show original ideas that address a real-world problem.

Look at the world around you and consider all the innovative ways that you could address the challenge. Even if things go wrong, use this to show what you have learned. Don't forget to use the student profile form to help structure your project.