CREST AWARDS

GOLD AWARD

THE PERFECT COLOUR LIPSTICK

70H Typically 70 hours of project work
Recommended for 16-18 year olds

Design & make project

Investigate the ingredients and colours of lipsticks.

#chemistry
#materials
#cosmetics

HOW TO RUN CREST USING THIS ACTIVITY

Entering your project without a teacher or facilitator? No problem! You can enter your work yourself by following this link: **www.crestawards.org/sign-in**

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 CREST Gold Award your students will need to:

- **Develop and lead the project**
- **Complete a minimum of 70 hours of project work**
- **Consider the broader impact of their project and demonstrate an innovative approach**
- **Write a project report or portfolio of evidence**
- **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 Gold Award project with the name(s) of the student(s) and the title of their project. If you don't have all these details, you can fill them in later!

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.

Run the project

Encourage your students to use the Gold student guide to plan and carry out their project. Each student involved in the project should complete their own profile form.

You don't want all their good work to go to waste, so be sure they keep a record of all their amazing progress. Keeping a regular project diary will save them precious time when writing their final project report.

The students should spend at least 70 hours on the project in total.

Remember to 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. At the end of the project, each student should complete a Gold profile form and communicate their project. This is a chance for them to reflect on all the interesting things they've learnt and the invaluable skills they have used.

Students working in a group can either submit a joint report or separate reports, but they must each complete a profile form.

Use the CREST criteria on the profile form to help the students check that they have included everything in their report.

Enter your project for a CREST Gold Award

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

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

Select your project and upload the profile form per student, project report and other evidence, such as pictures and diagrams.

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

Congratulations on submitting for CREST Gold!

What next?

Is university on the horizon for your students? They can use their project to help demonstrate their newly found STEM skills and knowledge in UCAS personal statements.

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

GOLD AWARD

In this project, you will investigate the ingredients of lipsticks. You will work out why lipsticks are certain colours, and work out how to change the consistency of lipstick, controlling it's 'spreadability'.

Getting Started

You will master the art of colouring lipsticks. Your aim is to be able to predict how to make a lipstick a desired colour, without any 'hit-and-miss' aspect.

- Carry out some research into how lipsticks are coloured and find out what pigments are. Find out about colour spectrums.
- Make your own lipstick using one colour pigment. Use a spectrophotometer to measure the absorption spectrum of your lipstick.
- Melt your lipstick and add another pigment. Keep doing this, adding different pigments each time. You could also make some new lipstick with different coloured pigments. Each time measure the absorption spectrum.
- Explain why the lipsticks are the colour they are.
- Take some shop-bought lipsticks of varying colours. Measure their absorption spectrum, and set about making lipsticks of the same colour

Now you've mastered the art of mixing pigments, you should look at some other properties of lipstick.

- Work out which ingredients affect the consistency of your lipstick. Make lipsticks of varying consistency and design a test to work out how easy it is to spread. Can you measure the viscosity of your lipsticks? What is the optimum viscosity and what ingredients are required?
- Design a test to measure the lipstick's transparency - the ultimate lipstick will give a smooth, even 'solid' coat using the minimum amount of lipstick.
- Design some tests to see how easy it is to remove your homemade lipstick. You don't want it to come off too easily but it should be removable without too much fuss. How does your lipstick compare to shop-bought products?
- Investigate the effect of temperature on your homemade lipstick. Can you measure how much the viscosity changes with the temperature? Does it make a difference where the lipstick is stored? How does your lipstick compare to shop-bought products?

Things to think about

Investigate the differences between lipstick and lip gloss. Why is lip gloss applied with a brush? What ingredients are different, and how do they make a difference to the final product?

Useful Resources

You will need to work closely with a local university or similar institution so you can use a spectrophotometer. You may also want to try contacting an analytical chemist working for a cosmetics company.

Search online for a reliable lipstick recipe.

STUDENT BRIEF

GOLD 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.

You should test your lipsticks on the back of your hand rather than on your lips. Only test your lipstick if it has been made hygienically in a food technology room with chemicals fit for human consumption.

Be alert to the hazards of the pigments. Remember some people may be allergic to some pigments.

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.