



**GOLD AWARD**

# WHICH FERTILISER WORKS BEST?



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



**Practical  
project**

Investigate the affects of  
fertilisers and composts on  
plant growth

***#biology***

***#agriculture***

***#gardening***



# 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](http://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](http://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](http://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](http://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](http://www.crestawards.org)

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## ***Which fertiliser works best?***

Despite the high rate of growth in rainforests the soil in these forests is poor in nutrients. The nutrients have been washed out of the soils by heavy rainfall. In this project you will investigate how the nutrients in soil affect plant growth and compare the effects of a range of fertilisers, composts and burnt wood ash on plant growth.

### ***Getting started***

You should start by doing some research into the nutrients needed for plant growth. You could find out about the different nutrients required and the different kinds of composts and fertilisers used by gardeners and farmers. You could then research the special case of rainforests.

The soil in rainforests is poor in nutrients – you should find out why this is and what effect it has on the plant life. You could also investigate how the indigenous people of rainforests farm the land. You should find out about “slash-and-burn agriculture” as carried out by both the indigenous people and by migrants to the area.

Collect a range of fertilisers and composts available from garden centres. You should include some organic/natural fertilisers in your tests.

You will need to make or obtain your own nutrient poor ‘soil’ to which you would add the compost, fertiliser or wood ash being tested.

You may need to do a trial test to ensure that your method gives usable results – you will then need to plan to use the time allocated for the project effectively and allow enough time for your samples to have grown sufficiently to give you acceptable results.

Your results: You will need to present your results using charts and graphs and you will need to comment on how your results compare to what you found out about compost and fertilisers and burnt wood ash in your research. You could also comment on the use of slash and burn agriculture. You should also evaluate your own experiments and comment on the reliability and validity of your results.

### ***Things to think about***

How will you make your test fair?

Which seeds will you use?

How many plants will you need to grow?

Will you use a propagator to help grow the seedlings?

If you choose to create your own wood ash fertiliser, how can your expert mentor help you with this?

How will you measure and record the results?

### ***Useful resources***

You could contact a local plant nursery or agricultural college and arrange a visit and discussion about plant nutrients and the use of different composts and fertilisers.

You could make a link with an expert who will be able to support you in your work.

You could devise experiments to compare the effects of various composts and fertilisers on the growth of seedling with the effect of burnt wood ash. It is important that you discuss your ideas for investigations with your expert contact.

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### **Health and safety**

A science project 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.

***Read and follow carefully the manufacturers health and safety instructions on any fertilisers you use.***

### **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.