



SILVER AWARD

PLANT GROWTH & FERTILISERS



Typically 30 hours of project work
Recommended for 14-16 year olds



Practical
project

Design an experiment to find
the best soil for seed growth.

#biology

#plants

#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

Looking for some support? Find a mentor by contacting your local STEM Ambassador hub:
<https://www.stem.org.uk/stemambassadors/localstem-ambassadorhubs>

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

- **Develop and lead the project**
- **Complete a minimum of 30 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 Silver Award project with the name(s) of the student(s) and the title of the project. If you don't have the details yet, 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 Silver 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.

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. 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 Silver CREST Award

Hard work deserves a reward! Celebrate and certify your students' achievements by entering their project for a Silver CREST 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 Silver!

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.

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

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

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How do fertilisers affect plant growth?

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 are going to investigate how different kinds of compost and fertiliser affect the rate of growth of plants.

Getting started

Start by doing some research into the nutrients needed for plant growth. 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 do some of your own experiments to investigate the effect the percentage of compost, different kinds of compost or different fertiliser have on plant growth.

Make or collect your own nutrient poor 'soil' to which you will add the compost, nutrient or fertiliser being tested.

Choose your seeds. Many types of seed will work, but radish or lettuce is often chosen because they grow quickly.

Plan your time! You may need to do a trial test. You will then need to plan to use the time allocated for the project effectively and allow enough time (probably 3 or 4 weeks) for your samples to have grown sufficiently to give you acceptable results.

Testing a range of fertilisers available from garden centres as part of your investigation – you should include some organic/natural fertilisers in your tests.

Plant your seeds in seed trays, water them, and place them in a well-lit location. You can help the seedlings to grow by maintaining humidity with a propagator lid on your seed tray. You could make a propagator using a polythene bag inflated around the seed tray or a 2 litre plastic bottle cut in half to provide a close fitting top.

Things to think about

How will you measure the rate of growth of your seedlings?

What will you measure and how often?

How can you ensure it is a fair test?

How do your results compare to your research?

How will you present your results clearly?

Useful resources

Why not contact a local gardener or farmer to find out about the different nutrients required and the different kinds of composts and fertilisers they use.

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 collect ideas for doing your own investigations.



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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.

Check for and take any needed precautions in case the fertilisers are hazardous.

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.