

GOLD  
CREST



# Introduction

2019-2020

## About Gold CREST

- You must be a year 12 student to register for Gold CREST
- This CREST student “pack” provides ideas and a framework to help and guide you through your Gold CREST project—**read through it before you begin.**
- As you know from your earlier experiences with CREST, this scheme offers you a chance to be innovative and to develop the project management skills used by scientists and technologists.
- At Gold, you must also expand your knowledge of specific techniques, language and analysis methods used in your area of research. Your consultant will help you to do them.
- CREST encourages you to use your knowledge in a creative way, helping you to bridge the gap between your academic learning and the challenges and opportunities of the world outside school.
- Completion of a Silver Award is a compulsory prerequisite for attempting a Gold project. This ensures that you have attained some experience at independent project work and an understanding of the CREST key steps.
- For the Gold CREST Award, you will be **assessed against set national standards.**  
This is different from all previous CREST Awards you have undertaken where you were assessed with reference to the improvement in your own knowledge and skills.
- Gold CREST cannot be gained from a school project alone.
- If you are completing this project for school assessment you will be expected to complete extra work to earn your Gold CREST
- You will develop your Gold project largely as a result of your own initiative, with guidance from a **supervising teacher, a consultant and the CREST assessor.**
- It is expected that you will develop a significant relationship with your **consultant/mentor.** You will, therefore, be required to communicate, on a regular basis, with your consultant. This must be clearly documented in your log book.
- Give your Consultant/Mentor a copy of the **Consultant/Mentor handbook.**
- If you would like to work with others try Team Gold CREST.
- You will need to allow additional time to participate in **Gold Seminars**
- CREST will support your project with **CREST seminars** (Video Link), Assessment meetings and support from the CREST assessor by email.

## *Assessment Standards*

### Evidence of creativity

- A **Gold CREST** student must demonstrate a high level of creativity and this may be achieved in a number of ways during the course of the project.
- You must demonstrate creativity in at least one of the following ways :
  - The design and/or development of new product
  - The development of a new method of testing or experimentation
  - Major modification of an existing experimental method
  - The execution of an original experiment
  - The application of an old idea to a new purpose
  - Creative interpretation of data collected.

### Completion of a planned programme

- You will be responsible for planning your project in terms of time, personnel, key factors and costs. This planning is expected to be realistic.
- As project leader you are responsible for the management of the project.
- You will be expected to achieve the **Key Steps** by the deadline set by CREST. This means establishing effective communication with your teacher, consultant and the CREST assessor to ensure you have the support you need to successfully complete your project.
- Any deviations from the plan must be documented and justified.
- You must show that you have revised your timeline as the project progresses and met all the set deadlines.

### Demonstrated use of knowledge

- You will be expected to consult experts and literature on the topic and construct a comprehensive reference list using books, journals and the Internet. All information collected should be assessed critically in terms of its usefulness to the project.
- You must then demonstrate appropriate use of this information in your project plans, justification of project approach, interpretation of data and in your conclusions and/or evolution of outcomes.
- All information must be referenced. CREST encourages you to critically analyse both the information and its source to establish its robustness and suitability.

### Communication with Consultant

- In a Gold project the consultant is an integral part of the process. You can have more than one consultant if your project requires it. You can also have a consultant for a particular part of the project
- You must be able to demonstrate that you have formed a meaningful relationship with your consultant/s.
- You should be able to show evidence that your consultant has been included in major decisions regarding your project. This is not to say that you should be led by the consultant but, rather, able to incorporate suggestions or ideas offered during meetings into your ongoing practice.
- You should feel confident to professionally discuss these ideas and offer other solutions or suggestions, even opposing those of your consultant.
- **Meetings** can be done, in person, by phone, email or video and should be regular and organised by you.

## Independent work

- This project is to be driven by you.
- Practical work must be performed by you where it is practical for you to do so.
- Where a large component of practical work is to be conducted by a third party the CREST assessor must agree. Where work is conducted by a third party **you** must commission the work and understand what is being undertaken.
- You should have a sound understanding of all aspects of your project and be able to explain the work that was conducted on your behalf.
- All prototype designs or experimental plans should be your own.
- Analysis can be conducted by another person but an evaluation should be your own. If necessary someone can teach you suitable techniques to enable you to conduct or analyse work for yourself.
- Any assistance you request must be executed under your direction or to your specification.

## Practical work

- Practical work must be at a level you can fully understand, execute yourself and modify based on data collected.
- You will be expected to conduct experimental or design work that is of a suitable standard to produce meaningful results.
- Where possible you will be required to take the project to an appropriate conclusion.
- For an experimental project or product testing, one set of data/observations is not sufficient. Your results should at least be replicated. Ensure valid results by careful selection of variables.
- For a technological project, your outcome should be evaluated against the established specifications of the brief, and any modifications made on this basis.
- All practice must be carried out to a standard recognised as appropriate by engineers, technologist or scientist working in your project area. The consultant and/or those working with you during the project will assess this.
- If it is not possible for you to work at an appropriate level of accuracy due to lack of knowledge, experience, equipment or cost, a compromise or change in plan will need to be agreed upon before work proceeds.

### Modification and improvement of approach

During the project you will need to evaluate your approach and make changes. This standard can be met in several ways:

- Altering and improving your experimental plan or design based on literature, previous experiments, mock-ups or prototype testing
- Repeating experiments, mock-ups or prototype testing (with improvements) to obtain better results
- Solving problems you encounter by modification of experiments or your design testing
- Conducting new data analysis based on previous procedures to obtain more useful information.

### Discussion of results

- When discussing your results and/or outcomes during your meetings, in your report, or in your seminar, you will be expected to be thorough and insightful.
- You should discuss your results and/or outcomes in terms of your aim, need or opportunity and against any brief or specifications you have.
- You should relate findings to the literature as well as comment on what you have found.
- You must ensure that your conclusions/observations are strongly based on your own research rather than just the research of others. Take care not to extrapolate too far.

### Evaluation of alternative solutions

- During your project you must investigate more than one possible solution to any problems that you encounter. This involves the collection of relevant information (from a number of different sources) and then a formal analysis of this information to choose the solution of “Best Fit” or most “Fit for Purpose” .
- You should be able to defend your sources of information and the criteria you choose to choose the best solution.
- This may be shown by
  - evaluation of different experimental methods
  - evaluation of different construction materials or methods
  - evaluation of different methods of analysis
  - evaluation of different methods of testing such as survey techniques.

### Justification of Decisions

- All decisions you make during the project must be able to be defended. This requires you to keep a detailed log book so that you can show how decisions were reached and to be able to defend, at meetings, the decisions you have made.
- You will be required to show evidence of information collected, experiments conducted or testing completed that support your major project decisions.
- In your log book you need to also keep a record how you prioritised both; the criteria you used to make the decision, and the information that you used. This is especially important if the information collected is in conflict.

### Final Report

- Produce a clear and concise report. Your report is not the only important product of your CREST project, but it does provide a means by which the external assessor can check whether or not you have met the standards.
- The report should be your work with some editorial input from your consultant/s and your supervising teacher.

# Time Line

## 2019-2020|Feb '19

- Work not submitted on time- will result in exclusion from the CREST process
- Weekly reports are compulsory

Step	What to do for CREST NZ	2018-2019	Dates
1.	Registration of Interest for Gold CREST NZ Received	22 Feb	2019
2.	Attend Gold CREST Seminar # 1 Teacher, Student and Gold CREST Assessor  <i>What is involved in completing a Gold CREST</i>	26 Feb	Term 1: 28/January-12/April  Easter, and ANZAC days included in April holidays
3.	Submit Application to Participate Gold CREST 2018-2019	6 March	
4.	Participation Confirmed	13 March	
5.	Attend Gold CREST Seminar #2 Teacher, Student and Gold CREST Assessor  <i>Feasibility/Background Research</i>  Invoice of \$200 per student sent to schools	15 March	
6.	Complete Feasibility/Background Research	10 April	
7.	Attend Gold CREST Seminar # 3 Teacher, Student and Gold CREST Assessor  <i>How to write a Gold CREST proposal</i>	10 April	
8.	Submit written Proposal	17 May	Term 2:29 April-5 July  Queen's Birthday: 3 June



9.	<b>Proposal Meeting</b> Teacher, Student, Consultant/s and Gold CREST Assessor	27 May-7 June	
10.	<b>Work on Project</b>		
11.	<b>Attend Gold CREST Seminar #4</b> Teacher, Student and Gold CREST Assessor  <i>Progress Report</i>	24 July	Term 3: 22 July— 27September
12.	<b>Submit Progress Report to CREST NZ</b>	30 Aug	
13.	<b>Progress Meeting with CREST NZ</b> Teacher, Student, Consultant/s and Gold CREST Assessor	9-Sept-20 Sept	
14.	<b>Attend Gold CREST Seminar # 5</b> Teacher, Student and Gold CREST Assessor  <i>Final Report</i>	6 Dec** <i>could be negotiated earlier if students' exams finished</i>	Term 4: 14 October- 13 December  NCEA Exams: 7 Nov- 2 Dec
15.	<b>On the right path?</b> Send the Gold CREST Assessor a copy of your draft report (to date)for a quick check and guidance.	24 January	
16.	<b>Submit Draft Report to CREST NZ</b>	7 Feb	Term 1 2020 27 Jan-9 April
17.	Draft Report returned to student/s	28 Feb	Waitangi Day 6February
18.	<b>Final Report to CREST NZ</b> 2 bound hard copies 2 digital copies ( on USB	Between 1-9 April <i>as negotiated</i>	Term 2: 28 April-3 July  Q's Birthday : 3/6

19.	<p><b>Attend Gold CREST Seminar # 6</b>  <b>Teacher, Student and Gold CREST Assessor</b>  <i>Assessment Meeting and Seminar</i></p>	1 May	
20.	<p><b>Final Assessment Meetings with CREST NZ</b>  <b>Teacher, Student, Consultant/s. Gold CREST Assessor and Expert Assessor</b></p>	By 29 May	
21.	<p><b>Gold Event including:</b></p> <ul style="list-style-type: none"> <li>• <b>Local Seminar Presentation</b>  <b>(Organised by Student and Teacher)</b></li> </ul> <p><b>And</b></p> <ul style="list-style-type: none"> <li>• <b>Gold Awards (Organised by CREST, RSNZ)</b></li> </ul>	By 3 July** as negotiated	