SOLAR Tasks (Student **O**wned **L**earning **A**nd **R**esearch **T**asks*)*

SOLAR tasks are based on the assumption that students are active, curious, social and able to look for knowledge. They are tasks which are directed and planned by small groups of students on the basis of an ill-defined task goal or problem. Although SOLAR tasks are similar to Problem-based Learning in many ways, there are also significant differences such as:

- SOLAR tasks have a specific focus on social skill development and resilience
- SOLAR tasks can focus on projects as well as problems.
- SOLAR tasks are more 'authentic' than many Problem-Based Learning (PBL) tasks eg they are school-based or community-based and the outcomes are put into practice rather than being hypothetical or case-study based as is often the case with PBL
- SOLAR tasks have more built-in opportunities for reflection and self-assessment

An example:

We want to make a bird-attracting garden in our school. Each group will research and present a proposal to the school council about how we might do this and why it is a good idea. Your recommendations will be presented in any form you choose. You will also be required, as a group, to develop and complete a rubric that assesses how well you worked together & the quality of your research and planning. Include in your plan a checklist or rating scale that the members of the school council can use to give you feedback on both your proposal and presentation

SOLAR tasks place students in the active role of problem-solvers confronted with a relevant but loosely-structured problem or project goal. They are given only a limited amount of detail, information and direction. The tasks and problems given reflect the kinds of complex problems encountered in the world outside the classroom. Such problems, do not have clear-cut, absolute answers and much of the relevant information needs to be acquired before the problem can be addressed or the outcome met.

Some of the potential benefits of SOLAR tasks are;

- Increased student engagement and motivation
- The opportunity for students to:-
    - integrate new information with what they already know and hence develop an integrated rather than a discipline-bound knowledge base. The task always requires the integration of a range of skills and knowledge across many discipline areas eg researching, writing, summarising, persuading, technology skills, science, maths (eg costing, statistics) etc.
    - gain experience in the kinds of research, problem solving and planning that is needed in real life
    - practise social skills such as active listening, sharing resources, sharing the workload, respecting each other's ideas, avoiding putdowns and making negotiated decisions.
    - experience opportunities to practise acting resiliently as they set goals and timelines, encounter problems that need to be resourcefully solved, maintain a positive attitude in the face of frustration and disagreement, handle strong feelings that occur and organise themselves.

Although it may take many forms, the key distinguishing features of SOLAR tasks are:

The Task is Authentic
The task has relevance to the student, the class, the school or the local community and is real in that it is followed by real-life action. For example student recommendations for the bird attracting garden (above) would be followed by implementation

The Students Determine The Type of Outcome
The outcome might be a proposed solution, a set of recommendations, a product, a display or exhibit, a presentation, a plan, a performance, or report. In most cases students make the decision about what form the outcome will take. In other cases the outcome is specified in general terms (eg some kind of presentation or display) and the students decide on the specific form it will take (eg dramatic enactment, powerpoint display, posters etc).

The Assessment is Authentic.
The relevant or expert assessors might be other students, school staff, senior school staff, local specialists, parents, students from a different school, the school council, members of the local council or community members.

It is a Collaborative Task
Students mostly work in small groups of three to five.

Research Drives the Learning
The learning that takes place is driven by the research that is needed to complete the project or solve the problem.

The acronym SOLAR also summarises these key features:

Student-directed and student-owned (but teacher-facilitated)

Opportunities to practise and reflect on the group's use of effective collaborative social skills (*eg sharing workload, negotiation, conflict management*) and resilience skills *(eg handling setbacks, being resourceful*) are built in to the task

Loosely structured complex problem or task with minimal detail and many possible outcomes that requires skills from several different disciplines *(eg IT skills, maths skills, writing skills, using powerpoint, presenting skills, photography etc)*

Authentic task (*ie it has a real purpose and is relevant to the lives of the students, the school community or the local community)* with authentic assessment and feedback (ie *by people who are interested or involved or who make decisions about whether it can actually happen or who are experts in the area)*

Research has to be undertaken *(eg library, internet, surveys, data collection)* in order to complete the task or solve the problem

STEPS

1. The teacher develops a complex, broad, and loosely structured problem or task, preferably based around a current area of learning. It should have no correct solution or best outcome. For example:

   The school wants to buy and install a barbecue system for the school grounds. Your group's task is to make recommendations to the class about the most suitable kind, costs, the best location and the best procedures to install it. All groups will be asked to present their proposal to the class and we will decide as a class on the best ideas to put into our final class proposal to the principal and assistant principal.

2. The teacher deconstructs the task to determine what skills will be required and then conducts an audit of the skills that students in the class already have. Any skills that are needed but which few students appear to have (eg how to prepare powerpoint displays) should be taught before the task is started.

3. Research is an essential component of a SOLAR task. Students always need to conduct enquiries, investigate using surveys or observations and/or research using information from the library, on the internet and from other sources (eg local experts). Some students or groups may require support through some kind of scaffolding. In the school barbecue example given above, students would need to find out about different kinds of barbecue systems, safety issues, relative costs and so on and some may need some assistance with internet addresses or catalogues.

4. The teacher builds a rubric or self-assessment tool into the task. Such a rubric or self-reflection sheet is completed by the group as a whole and may focus on one or more of the following:
   - How well did they cooperate and work as a team?
   - Did they use multiple resources?
   - How well did they share resources and the workload?
   - Did they reflect on what they learned in some depth?
   - How well did they manage their time and meet deadlines
   - How well did the group make negotiated decisions?
   - How did they divide up the tasks?
   - How well did they maintain an optimistic and committed group attitude?

Alternatively each group may be asked, as part of the overall task, to develop their own teamwork rubric for this purpose.

5. Students meet in their groups to identify what they already know, what they need to research or investigate and the best way of locating or finding out about the information they need to complete the task. They also consider the outcome and product that will best suit their plans. They (or the teacher) could choose outcomes such as:

Artwork	Booklet or brochure	Brochure
Collection of resources	Construction	Drama presentation
Exhibition or display	Itinerary	Letter
Multi-media display	Newsletter item	Newspaper report
Poster	Powerpoint display	Presentation

Proposal or plan	Recommendations	Research data
Solution	Walking tour	Website

6. The teacher and the class may decide together on the best way to assess the group products or each group may be asked to decide on their own approach. The group is required to develop and prepare any agreed form of assessment or feedback such as:

    - *Audience or consumer feedback sheet* (eg for presentations, performances, booklets, class lesson, game, walking tours)
    - *Suggestions for improvement* (eg for presentations and performances)
    - *Evaluation rubric* (eg for proposals, plans, presentations, posters, solutions, performances, walking tours, recommendations, brochures, reports)
    - *Rating scales* (eg for displays, exhibitions, performances
    - *Checklists (with or without ratings*)(eg for proposals, plans, presentations, performances)

Some Examples of SOLAR tasks

Task: Make a healthy recipe book for same-aged students
Your group's task is to produce a healthy recipe book for same-aged students in this school to use. You will be expected to present it to a group which will consist of parents, staff from the health faculty and students and answer their questions. You will also be expected to develop a way of evaluating it's acceptability and effectiveness as assessed by same-aged students.

Problem: How can we increase the number of students with first aid skills?
The school wants to increase the number of students with first aid skills in your school. Your group's task is to make a plan for the best way to do this. You will be required to present your ideas to members of the school's leadership team who will provide feedback on your proposal. The best components will be incorporated into the final project

Problem: How can levels of student fitness at this school (or year level) be increased?
Your group's task is to make a plan to increase the fitness level of the student population at your school and present and defend your plan to staff. They will give feedback on your plan and the best ideas will be incorporated into an overall plan that will be implemented.

Problem: How can the available food in the canteen be healthier?
The school has asked your group to help them to develop a plan for serving healthy snack foods to students in the canteen. Your group's task is to work with the canteen staff and develop a plan whereby they trial certain healthy snack foods. You are expected to write a report for the canteen sub-committee of the school council. The council will give feedback on your groups' plan. The best ideas will be incorporated in the school's final plan.

Problem: How can we improve our school's sports carnival
Your group's task is to develop a plan to incorporate three new ideas which will help the school's sports/swimming/athletics carnival run well. You will be expected to

present your ideas to a representative group of staff and students. Good ideas will be incorporated into the final plan
will provide you with a list of ordered materials.

Task: Make an effective DVD about bullying for other students
Bullying is becoming more and more of a problem in schools. Your group's task is to plan and create a DVD about bullying for students in your year level that will be appealing and help to prevent bullying in the school. You will be expected to show your DVD to a panel of teachers who will evaluate it on specific criteria. You will also be expected to conduct an audience survey.

Problem: What is the best way to help students at the school learn more about the local flora and fauna?
The school has asked your group to make an instruction manual for students at the school on how and where to find interesting animals, plants and insects in and near the school. You will be expected to 'road test' your manual and nature walk (before you submit it to a panel of teachers for assessment) and write up your results. Your manual will be printed and used by students in year two and then stored in the library for future student use.

Task: Create an effective walking tour of the local area near the school
Your group's task is to plan an historic walking tour of the town/suburb or a brochure on the closest national parks/tourist attractions etc. Your guide booklet or brochure will be submitted to the tourist bureau for feedback and recommendations and then incorporated into their collection.

Problem: How can our school reduce its ecological footprint?
Our school wants to identify the 'size' of its ecological footprint and identify ways to reduce it. You will work in small group each with a different perspective ion this problem.
Group One: Your task is to make recommendations about the school's use of water
Group Two: Your task is to make recommendations about the school's use of paper
Group Three: Your task is to make recommendations about the school's use of electricity
Group Four: Your task is to make recommendations about the school's plant life and gardens
Group Five: Your task is to make recommendations about the school's approach to rubbish and recycling
Each group will be required to present their data and recommendations to the school council and/or senior staff in the form they decide is most appropriate. Each group will also be required to develop an assessment rubric for these people to use,

Task: Document the multicultural nature of our community
Your group's task is to research, plan and make a video documentary or photographic display about the multicultural features of your local community. You are also required to develop a survey to obtain feedback on your product from selected samples of people who view the documentary.