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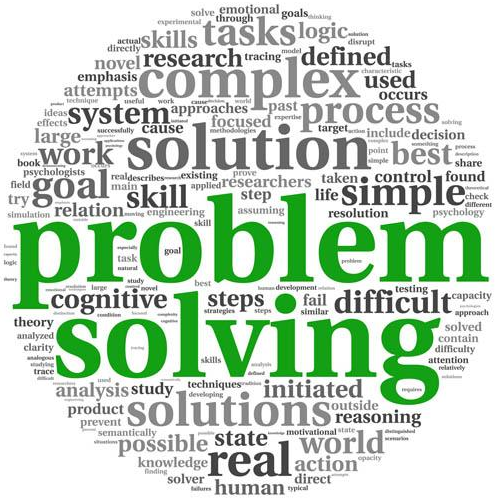


# Problem Solving

## Ethos of Learning

"If you're not solving problems then you either know everything already or you're not maximising your learning skills "

Alex Wallace , Assistant Head

**Problem Solving in a Rapidly Changing World**

Here are a couple of facts we all learnt in history: the Battle of Hastings was fought in 1066 and the Magna Carta was signed in 1215. We learnt these facts, but do we know the consequences of the battle or why the Magna Carta was signed?

Schools need to respond to the age they are in. In the Middle Ages education was available only to a tiny minority who studied religious texts. In the industrial age, education was expanded to training people to work in factories, mills and on farms. In our time there are very different challenges faced by students.

It is anticipated that approximately two thirds of school children today will join a workforce in a job which does not yet exist. They will have to use technologies that have not yet been invented, be expected to solve complex problems such as climate change and sustaining an ever increasing population, problems that we have not yet managed to solve.

So how can we best teach the students of today to meet these changes as effectively as possible? The type of skills required in the workplace is changing. There has been a steep increase in the demand for complex communication

and thinking skills and a sharp decline in the demand for the routine, repetitive cognitive and manual skills which formed the mainstay of traditional teaching methods.

*Problem solving and critical thinking is the ability to cross-examine evidence and logical argument. To sift through all the noise."*
Richard Arum, New York University Sociology Professor

In 1970, according to the Fortune 500 companies, the most sought after skills were reading, writing and maths; by the turn of the century, these skills had changed to teamwork, problem solving, interpersonal skills and oral communication; today, the most important skills for employees are problem solving and critical thinking.

As one example, the company *Google* values the ability to learn, discover new information, solve problems, critically analyse data and collaborate in the design of new products and solutions.

## How do you Become Successful in Learning?

According to recent global school league tables, published in 2015 by the Programme for International Student Assessment (PISA), Asian countries are in the top 5 places and African countries at the bottom. In comparison, the UK ranks in 20th place, with the US in 28th place out of the 76 PISA countries.

Singapore, a top performer, which had almost no education system in the 1960's until it became independent, shows how much progress can be made. The Singapore Education Minister was quoted as saying '*The goal is less dependence on rote learning, and more engaged learning, discovery through experiences, differentiated teaching, the learning of life-long skills, and building of character through innovative and effective teaching…*'

*"Do people make use of information that's available in their journey to arrive at a conclusion or decision? How do they make use of that?"*
Global Head of Recruiting, Goldman Sachs Group

We need students who investigate, enquire, discover and learn in new ways whether it is scientific investigation, literary analysis, mathematical application, proficiency in a language or artistic performance. All of these represent a discipline of problem solving.

### Why is 'Problem Solving' Important in Later Life?

It is particularly important now. We are in an age where society cannot succeed if its students are not learning in a way that will enable them to solve the problems they will be faced with in the future and to engage with the whole of society. In summary, we need to equip our students with the development of knowledge and invention that is essential for 21st Century societies and economies.

## Ethos of Learning

Inquiry-based learning is a challenge for both teachers and students but, given the documented benefits[1] in terms of student interest and engagement and the future benefits for career progression, it is one RGS will continue to promote within the curriculum.

Teachers at RGS regularly produce lessons which afford students the opportunity to develop their problem solving skills. Students are often given the end point and required to work out how it got to that point. Just this morning I was watching 30 Year 12 Physicists working with an old boy (and McLaren employee) to try and work out how to produce the fastest car from numerous pieces of data. The problem solving skills were certainly to the fore.

At RGS gone are the days of rote learning. The lessons I frequent regularly show high levels of problem solving, engagement and resilience. All three of these attributes need to work in unison to achieve the highest success.

## What can parents do?

Your young men are at an age when they should be taking responsibility for themselves. However, you will always want to support them. Here are a few ideas how:

- When they come across problems don't rush to give them the answer.
- Ask them to break down the problem, to look at it from other people's point of view.
- Get them to talk the problem through with you. Whether it be an academic or pastoral problem, dialogue and support is crucial in solving it.

Your child might say the words, "I don't understand". Rather than tell them the answer, see if they can research how to solve this problem. Research suggests you retain 90% of what you teach compared to 10% of what you hear. Encourage your son to do the research to teach himself and then maybe get him to teach you once he has done that to consolidate the learning.

[1] Exploring Young people's views on Science, Wellcome Trust, 2011

Encourage them to enjoy being stuck as this provides a real opportunity to learn!

In the workplace, what happens when you have a problem? Often the initial reaction is to speak to your peers, to collaborate, to research. Solving a problem is often difficult and can require teamwork as part of the problem solving process. It is fine to do this with your son as this is modelling the lifelong learning we want instilled within them. But please don't do it for them!

*For further information on the Ethos of Learning please refer to the RGS website: www.rgshw.com or Alex Wallace, Assistant Head, arw@rgshw.com*