KNOX GRAMMAR SCHOOL

STATE

DA VINCI DECATHLON 2019

CELEBRATING THE ACADEMIC GIFTS OF STUDENTS IN YEARS 5 & 6

IDEATION

TEAM NUMBER _____

1	2	3	4	Total	Rank
/15	/10	/25	/10	/60	

Complete the above table with question numbers and marks as required.

IDEATION

WHEN I GROW UP…

BACKGROUND

One of the topics discussed amongst children and parents, teachers, or other adults in their lives is, "What do you want to be when you grow up?" Future occupations of astronauts, teachers, nurses, doctors and pilots are all common responses. But research has shown that career paths of the future will not be quite so simple.

The employment and workforce landscape in Australia is changing

a. The work that we do

b. Where we will work

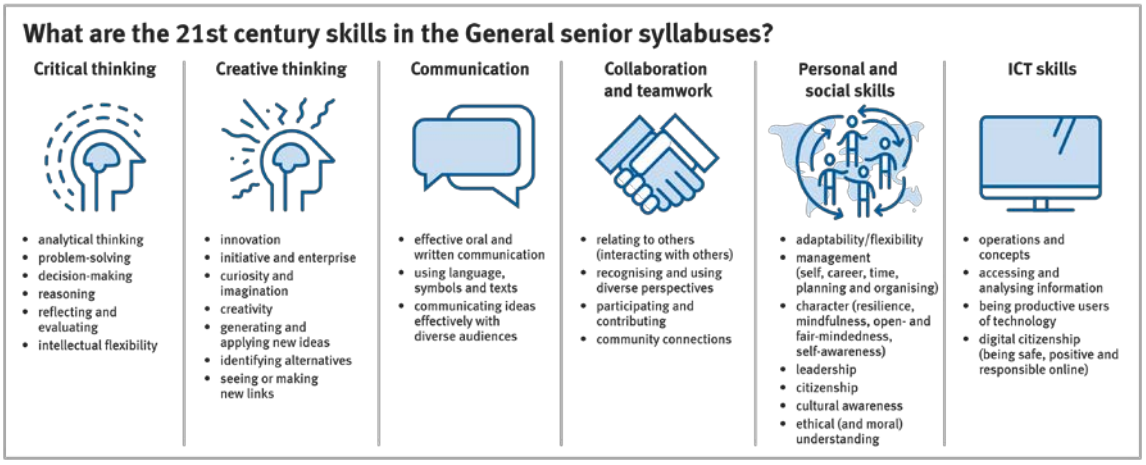
c. How we will work

This is influenced by:

1. Automation: ever smarter machines performing ever-more human tasks
2. Globalisation: our workforce goes global and the global workforce comes to us
3. Collaboration: many jobs, with many employers

Jobs that we take for granted today may not exist in the years to come. Already we see that in the last 25 years, hundreds of thousands of jobs such as secretaries, labourers, tradies and machinery workers have declined. It is estimated that 40% of Australian jobs are at high risk of automation in the next 10-15 years. One education expert, Anthony Seldon, believes that by 2027 even teachers will be replaced by robots.

Education departments across the country talk about 21st century skills as a way of providing students of today with the tools necessary to succeed in a future workforce. The image below shows the skills that the Queensland Curriculum and Assessment Authority identify as 21st century skills.



The Foundation for Young Australians identify "Enterprise Skills" as being those skills that are transferable because they can be used in many jobs. They are also in high demand as

employees with enterprise skills receive higher wages.

THE PROBLEM

We are not far from entering the third decade of the 21st century. The time has come for some **radical reform** to ensure that our **young people of today** are **equipped** to **succeed** in the evolving **workforce landscape**. Collaboration between schools (teachers, students, parents), governments, universities, employers could lead to innovative solutions to better support the development of our youth.

The government is building a new school and has engaged your consulting services to develop and trial a new way of working with students to ensure that they develop the skills that they need. The government is concerned that the current schooling model (based on a model designed in the 19th century) is failing our young citizens. Students are placed in classes based on when they were born and are taught standardised content, usually by one teacher, in a room with 4 walls. Your team will provide the government with a new model of schooling, one that reflects the needs of the 21st century. You are well-known for your flexible and original thinking and you will need to draw on this as you develop a radical new design.

THE DESIGN CHALLENGE

Your **challenge** is to design an innovative **education** and **schooling** solution to better equip the students of **today** with the skills they will need to succeed in future employment. Consider the options that technologies such as Virtual Reality provide. Be creative in the way classes are structured, taught and the environment of the school itself. Perhaps the 'school' is not a physical space, or perhaps the location of the 'education' constantly changes and there is no fixed location at all. Your solution should draw on technologies that are available today or those that may be **feasible** in the next few years (no teleporting teachers). Consider the role of the students, teachers, parents and employers in the school that you develop.

Your answer may focus on **one area**, such as the **infrastructure** of the school (buildings, timetables, resources) or the **curriculum** (what is taught and how it is taught). Or you may choose a more **holistic solution** that outlines both infrastructure and how your students will effectively develop the 21st century skills.

Answers which are both **original** and **achievable** in the **next five years** will score highly. Solutions need to be realistic (again, no teleporting) and innovative. Be wary of using the school

model you know so well and just changing one or two things. Be **radical** and **bold** in your thinking.

You will have **ninety (90) minutes** to complete the four components below.

Stimulus material to assist in your solution is attached at the end of this paper.

Please **carefully read** the marking criteria on the following pages for additional guidance on what to include in the answer templates provided, and where to do so.

The following components provide a structure for your work:

EMPATHISE (Ethical Decision-Making Framework) (15 marks)

> This involves evaluating what 'ought to be done', through considering rights, obligations, fairness, the benefits and detriments for societies and other virtues. Reaching a final decision involves a degree of conviction and belief in what is 'the right thing to do'.

DEFINE (Design Brief) (10 marks)

> Here, you must identify the problem, outline the ethical issues, evaluate the challenges and research findings, and identify possible solutions.

IDEATE (Reflection) (25 marks)

> You must then reflect on your solutions and whether they will be viable. A preferable solution should be identified, and any unanswered questions should be addressed. Issues of implementation are also crucial to reflect upon.

CREATE (Prototype) (10 marks)

Finally, a design for how your ideas and solution will be disseminated must be produced. This could be a story-board, mind-map, diagram, model, narrative or any other appropriate medium. Critically, an audience must be able to understand the process of dissemination by examining this prototype.

MARKING GUIDELINES

1. **Empathise (15 marks)**

Research Area	LIMITED	DEVELOPING	EFFECTIVE	COMPREHENSIVE	TOTAL
Factors contributing to the issue	0-1	2	3	4	
Consequences if issue not addressed	0-1	2	3	4	
People and perspectives	0	1	2	3	
Barriers to addressing the issue	0-1	2	3	4	
				TOTAL	/15

2. Define (10 marks)

ASPECT	LIMITED	SOUND	EFFECTIVE	OUTSTANDING	TOTAL
Vision statement: articulate and succinct	0-1	2-3	4	5	
Connecting to research: research used to support vision	0-1	2-3	4	5	
				TOTAL	/10

3. Ideation (25 marks)
Circle the mark for each aspect of each solution.

ASPECT	Idea	Positive Consequence	Negative Consequence	TOTAL
Solution 1	0/1/2	0/1	0/1	
Solution 2	0/1/2	0/1	0/1	
Solution 3	0/1/2	0/1	0/1	
			TOTAL	/15

Ideate: Reflect & Evaluate cont.,

ASPECT	LIMITED	SOUND	EFFECTIVE	OUTSTANDING	TOTAL
Justification for chosen solution	0-1	2	3	4	
Implementation: identifies details of who, when, where	0	1	2	3	
Dissemination: measure of success and strategies for gaining support for idea	0-1	2	3	4	
				TOTAL	/15

4. Prototype (10 marks)

ASPECT	LIMITED	SOUND	EFFECTIVE	OUTSTANDING	TOTAL
Originality and creativity	0-1	2-3	4	5	
Clarity and communication of ideas	0-1	2-3	4	5	

Appeal to an audience	0-1	2-3	4	5	
				TOTAL	/15

TOTAL: /60

SUPPLEMENTARY MATERIAL

Future Classroom lab learning zones
Source: http://fcl.eun.org/learning-zones

PHOTO: **Students studying at Rainbow State School in north-west Victoria, circa 1900.** **(Supplied: Public Record Office Victoria)**
Source: https://www.abc.net.au/news/2015-03-04/school-days-exhibition-traces-history-of-education-in-victoria/6277364

PHOTO: WA primary school classroom 2016
Source: https://www.abc.net.au/news/2016-05-11/wa-primary-school-classroom-2/7402782

ARTICLE: 5 CHARTS THAT EXPLAIN THE FUTURE OF EDUCATION

Written by Adam Shirley (18/5/2016), World Economic Forum

Children need to learn social and emotional skills if they are to thrive in the workplace of the future, a World Economic Forum report has found.

The new research shows that as the digital economy transforms the workplace, Social and Emotional Learning (SEL) skills such as collaboration, communication and problem solving will become ever more important as more traditional roles are mechanized.

With more than half of children now entering school expected to work in jobs that don't yet exist, adaptability is becoming a core skill.

What is SEL?

Social and Emotional Learning skills are those abilities that lie outside core literacies such as reading, writing and arithmetic. They allow creativity, problem solving and communication and have at their heart social interactions.

Of 16 skills identified in the report as important for the 21st century, 12 are SEL.

Students require 16 skills for the 21st century

Image: WEF

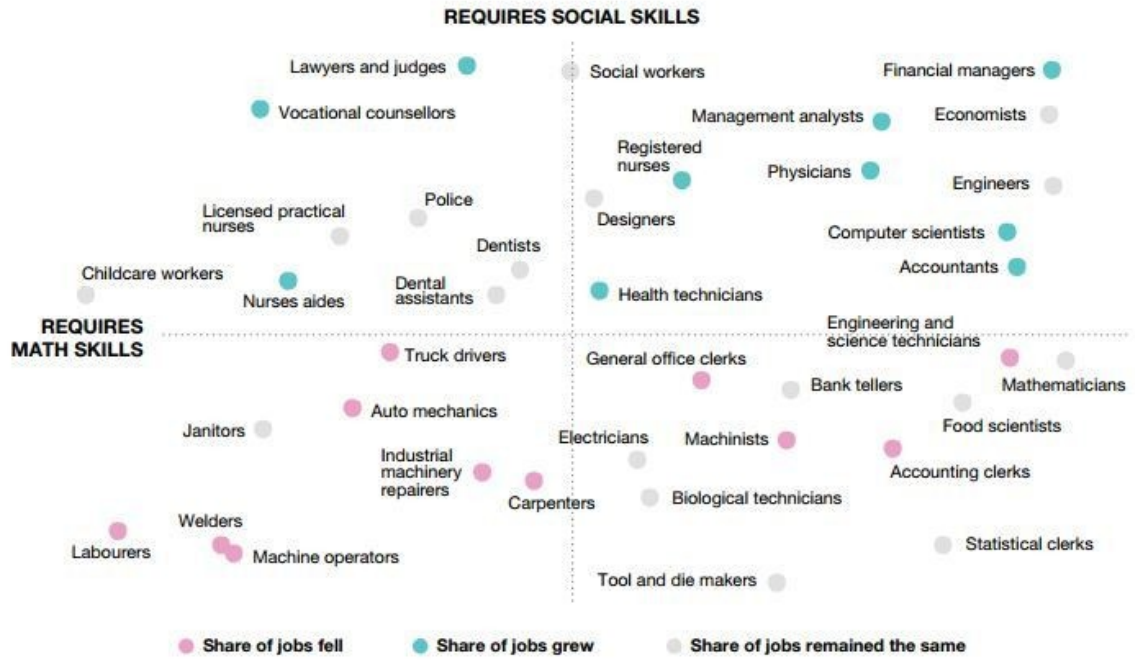
How do we know that jobs are going to change?

There has already been a shift towards jobs which require social skills.

Research has shown that in the United States, since 1980, employment opportunities in roles which require more SEL skills have surged, while those requiring the least SEL skills have contracted.

This is a trend which is predicted to continue.

Exhibit 2: Since 1980, jobs requiring social skills have surged



Note: The position of an occupation on the x and y axes reflects the intensity of math and social skills required, based on calculations by David Deming, using data from the Occupational Information Network (O*NET), a survey administered by the US Department of Labor. The bubble color reflects changes in the share of jobs from 1980 to 2012. Jobs with shares that changed in a range from -24 to 24 percentage points are grouped under "Share of jobs remained the same", jobs with shares that changed by more than 24 percentage points are grouped under "Share of jobs grew" and jobs with shares that changed by less than -24 percentage points are grouped under "Share of jobs fell".

Adapted from Miller, Claire Cain, "Why What You Learned in Preschool Is Crucial at Work", *The New York Times*, October 16, 2015, http://www.nytimes.com/2015/10/18/upshot/how-the-modern-workplace-has-become-more-like-preschool.html, based on data from Deming, David J., *The Growing Importance of Social Skills in the Labor Market*, Harvard University and NBER, August 2015, http://scholar.harvard.edu/files/ddeming/files/deming_socialskills_august2015.pdf.

Since 1980, jobs requiring social skills have surged

Image: WEF

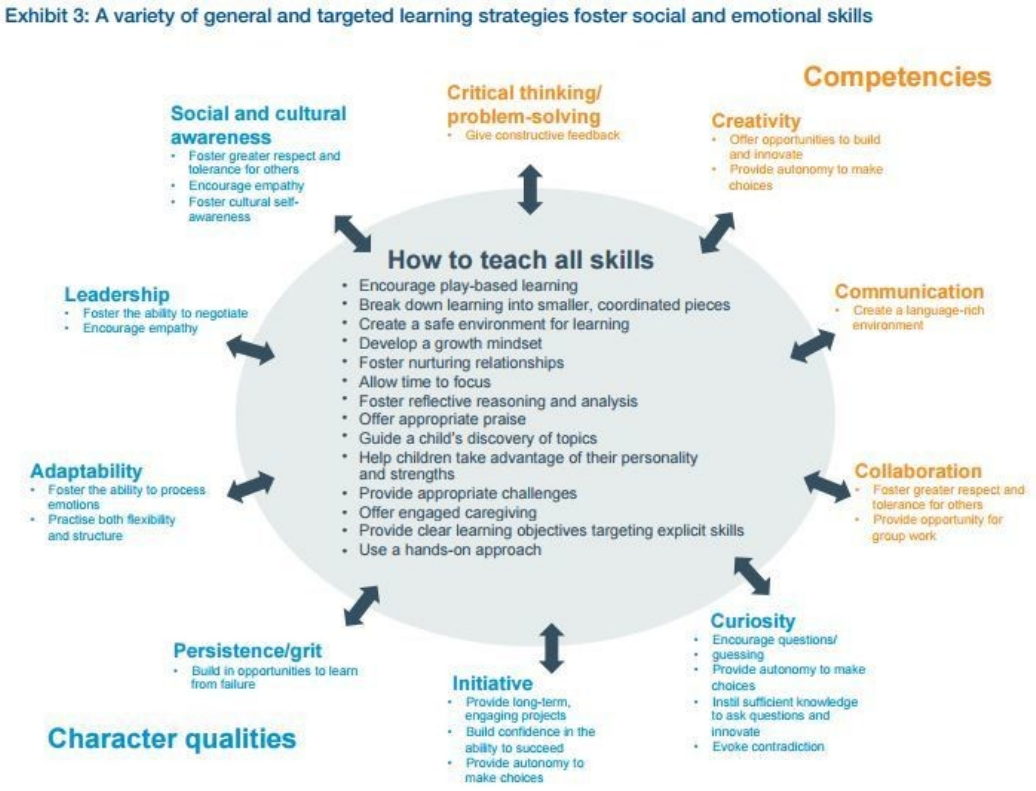
So how do we teach these skills?

In the classroom, SEL skills can be developed by cooperative group work, discussions, peer-to-peer teaching, problem-solving and group reflection.

Project and inquiry-based learning can also help children to learn to think critically, use technology and solve problems.

Outside the classroom, parents and caregivers can encourage children to develop SEL skills by remaining engaged in their child's education and providing a safe and nurturing environment.

Extracurricular activities such as sports, music and scouting have also demonstrated the ability to teach children SEL skills.



A variety of general and targeted learning strategies foster social and emotional skills

Image: WEF

Does this mean we should use less technology in schools?

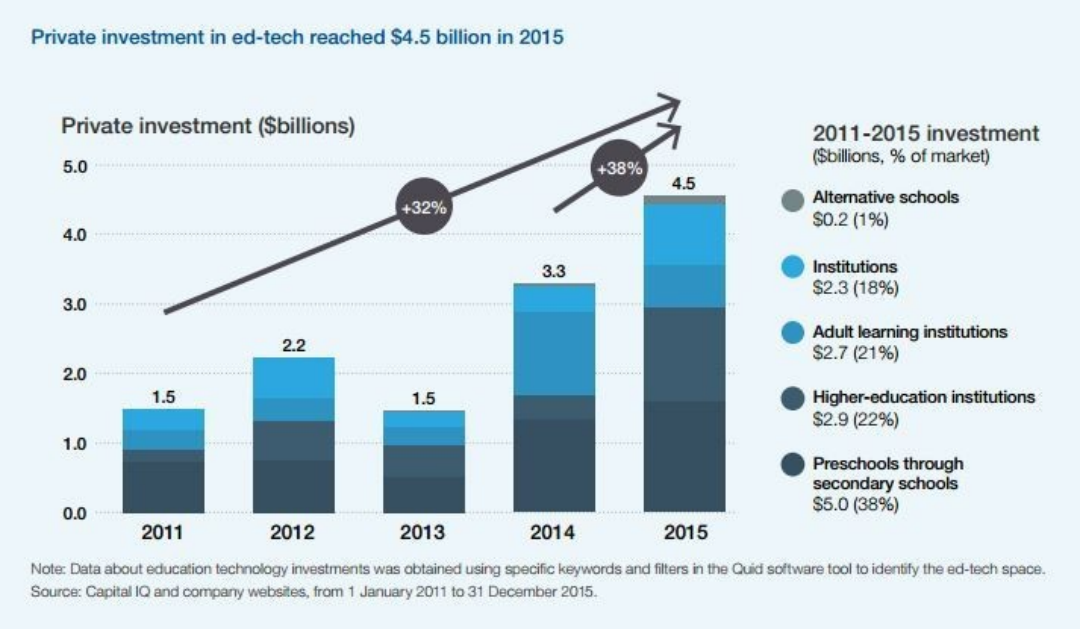
Although schools need to develop interpersonal skills, technology has an important part to play. Technology can personalize learning, complement what happens in the classroom, and provide access to learning for those with insufficient educational opportunities.

Existing technology like videogames can aid in the development of education. Strategy games such as *Sid Meier's Civilization V*, teach an understanding of the intricate relationships among the geographical, historical and economic systems that shape civilizations. Sandbox games like *Minecraft* can boost SEL skills like collaboration, creativity and problem-solving.

Leading-edge technologies like wearable devices, apps, and virtual reality can also improve SEL skills.

Wearables are already being used to help students manage their emotions and build communication skills, while virtual reality can be used to take children on virtual field trips that build curiosity and improve critical thinking.

Investors are increasingly interested in the potential of education technology. Private investment in ed-tech for all age groups globally has increased at a 32% average annual pace, from $1.5 billion in 2011 to $4.5 billion in 2015.



Private investment in ed-tech reached $4.5 billion in 2015

Image: WEF

So what's the problem?

Despite this investment, the report found that there are several reasons that SEL is being given insufficient priority in educational policy development.

There is limited awareness of SEL and its benefits, insufficient prioritization of SEL skills, a lack of consensus about valid and reliable SEL measurements, low levels of funding and resources for SEL, and an inadequate supply of SEL programmes and products.

Collectively, these challenges impede the development of educating social and emotional skills for the future.

A vicious circle of barriers impedes the adoption of SEL and ed-tech for SEL

Image: WEF

If students are to thrive, policy-makers, educators, parents, businesses, researchers, technology developers, global organisations and investors must overcome these barriers.

Today's students need to be equipped with SEL skills alongside traditional academic learning in order to compete in future markets. Teaching SEL skills will benefit the businesses, economy and society of the future as well as individuals.

https://www.weforum.org/agenda/2016/05/5-charts-that-explain-the-future-of-education/

END OF PAPER

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TIPS FOR MARKING

When marking ideation, it can be hard to access the scope of thinking linked to the design challenge. For markers, we have a short amount of time to become familiar with the problem before we launch into trying to mark effectively, efficiently and fairly.

Below is some thinking that I did whilst writing this task – some ideas of things to look for. This list is not exhaustive, and I have no doubt that many talented teams will come up with a wide range of solution ideas.

STEP 1: EMPATHISE

Factors contributing to the issue:

Mass education model

Automation

Globalisation

Lack of connection between schools and industry

Conservative attitudes amongst communities of what an education SHOULD look like

Consequences:

Status quo

Workforce not equipped for demand of jobs

Economic ramifications (national and personal)

Participation in employment affected (increased unemployment)

Inequality

Mismatch of skills taught and skills required by employers

People and perspectives:

Students, teachers, parents, school leadership and administration, business and industry leaders, employers, governments (state, federal, global),

STEP 2: DEFINE

Vision statement should be concise and clear, without ambiguity.

Teams must include relevant facts drawn from the supplementary material to score highly. You may score on fluency (number of facts used) and/or on how they elaborate on the facts and the connections they make.

STEP 3: IDEATE

Solution ideas that are considerably different to current education and schooling models should be scored highly. Solutions that use the existing model and change 1 or 2 things will score a 0.

Implementation should include specifics as this informs the prototype. Answers such as When: as soon as possible; Who: everyone; Where: everywhere will receive 0 marks.

STEP 4: PROTOTYPE

Prototype should be understood without having any prior knowledge of the idea. This means the team have communicated their ideas effectively including how it will be implemented. If the prototype is not clear and confusing to understand the solution, this should be reflected in low scoring marks.