Structure

– a ten week program including a weekly timetable is currently under development and will be posted here in the near future

Refer to following pages for assessment, VELs, article on Galileo and Program Descriptions

VELS DOMAINS	ASSESSED AREAS OF PROGRAM						
		Toolbox Workshops	Individual Rich task	Melbourne Roam	Group project	Group Presentation	Individual Journal
	Interpersonal Development						
	• Building social relationships • Working in Teams.						
	Personal Learning						
	• Independent learning • Managing personal learning strategies						
	Thinking Processes						
	• Reasoning, processing and enquiry • Creativity • Reflection, evaluation & metacognition						
	Communication						
	• Listening, viewing & responding. • Presenting						
	Civics & Citizenship						
	• Civic Knowledge & Understanding						

	• Community engagement						
	Health &P.E						
	• Movement & physical activity. Health Knowledge & promotion						

INTERPERSONAL DEVELOPMENT

Building Social relationships

- Empathy to others
- Appropriate behaviour in diverse contexts
- Strategies for managing differences in social relationships.
- Working in teams.

Working in Teams

- Skills to articulate
- Self-confidence
- Strategies for motivating group members
- Strategies for creating ideas and solving problems
- Engagement of all teams members.

PERSONAL LEARNING.

The Individual Learner

- Application of learning style preferences
- Strategic learning behaviours
- Flexible use of multiple learning strategies
- Self assessment.

Managing Personal Learning

- Continuous monitoring and evaluation.
- Planning and behaviour
- Coping strategies
- Time management
- Thoughtfulness and independence.

THINKING PROCESSES.

Reasoning. Processing and enquiry.

- Selection of information
- Connecting of information
- Problem solving
- Use of appropriate methodologies
- Synthesis of information/

Creativity

- Use of a range of self selected creative thinking strategies

Reflection, evaluation and metacognition.

- Justification of thinking processes
- Analysis of changes in thinking
- Awareness of methodologies used to create and verify knowledge.
- Understanding of their own and others' viewpoints.

COMMUNICATION

Listening, viewing and responding

- Ongoing discussion
- Presenting in a variety of forms
- Reflection on alternative responses
- Knowledge of terminology, symbols and codes.

Presenting

- Experimentation with different presentations
- Identification of expressive or aesthetic qualities
- Analysis of strategies used by others
- Choice of appropriate vocabulary and conventions.

CIVICS AND CITIZENSHIP

Civic knowledge and understanding

- Knowledge of Australia's political system.
- Knowledge of ways citizens participate and influence government
- Knowledge of democratic values
- Knowledge of global organizations

Community Engagement

- Justification of a point of view about a national or global issue.
- Development of an action plan to address a social or environmental issue.
- Involvement in a citizenship activity in the school.

HEALTH AND P.E

Movement and physical activity

- Use of motor skills, strategic thinking to improve individual and team performance.

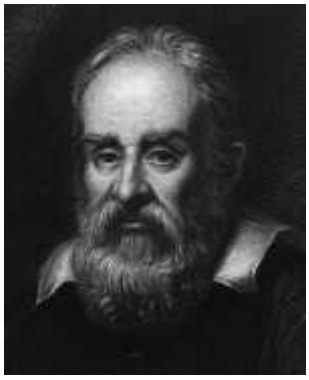
Health knowledge and promotion

- Knowledge of social and cultural influences on the development of personal identity and values.
- Knowledge of the rights and responsibilities associated with the increasing independence of your people
- Identification of personal and community behaviour that affect health

Galileo Galilei - Biography

Galileo Galilei was born in Pisa, Italy on February 15, 1564. He was the first of 7 children. Although his father was a musician and wool trader, he wanted his clearly talented son to study medicine as there was more money in medicine. So, at age eleven, Galileo was sent off to study in a Jesuit monastery.

After four years, Galileo had decided on his life's work: he announced to his father that he wanted to be a monk. This was not exactly what father had in mind for his gifted son, so Galileo was hastily withdrawn from the monastery. In 1581, at the age of 17, he entered the University of Pisa to study medicine, as his father wished.



Shortly thereafter, at age 20, Galileo noticed a lamp swinging overhead while he was in a cathedral. Curious to find out how long it took the lamp to swing back and forth, he used his pulse to time large and small swings. Galileo discovered something that no one else had ever realized: the period of each swing was exactly the same. The law of the pendulum, which would eventually be used to regulate clocks, made Galileo instantly famous.

Unfortunately, except for mathematics, Galileo was bored by most of his courses and outspoken to his professors. His frequent absences from class eventually led the university to inform Galileo's family that their son was in danger of flunking out. A compromise was worked out, where Galileo would be tutored full-time in mathematics by the mathematician of the Tuscan court. Galileo's father was hardly overjoyed about this turn of events, since a mathematician's earning power was roughly around that of a musician, but it seemed that this might yet allow Galileo to successfully complete his college education. In the end, Galileo left the University of Pisa without a degree--a college dropout.

Faced with the need to somehow earn a living, Galileo started tutoring students in mathematics. He did some experimenting with floating objects, developing a balance that could tell him that a piece of, say, gold was 19.3 times heavier than the same volume of water. He also started campaigning for his life's ambition: a position on the mathematics faculty at a major university. Although Galileo was clearly brilliant, he had offended many people in the field, who would choose other candidates for vacancies. Ironically, it was a lecture on literature that would turn Galileo's fortunes. The Academy of Florence had been arguing over a 100-year-old controversy: What were the location, shape, and dimensions of Dante's Inferno?

To modern ears, this type of question sounds like asking for the location of Sherlock Holmes's 221B Baker Street, or the size of Dr. Frankenstein's castle. But the question was absolutely serious, and Galileo, asked to answer the question from the point of view of a man of science, treated it with dignity. Extrapolating from Dante's line that "[the giant Nimrod's] face was about as long/And just as wide as St. Peter's cone in Rome," Galileo deduced that Lucifer himself was 2,000 arm lengths long. The audience was impressed, and Galileo was remembered with favour.

Within the year, Galileo had received a three-year appointment to the University of Pisa, the same university that never granted him a degree!

The Leaning Tower of Pisa

At the time that Galileo arrived at the University, some debate had started up on one of Aristotle's "laws" of nature--namely, that that heavier objects fell faster than lighter objects. Aristotle's word had been accepted as gospel truth, and there had been few attempts to actually test Aristotle's conclusions by actually conducting an experiment!

According to legend, Galileo decided to try. He needed to be able to drop the objects from a great height. The perfect building was right at hand--the Tower of Pisa, 54 meters tall. Galileo climbed up to the top of the building carrying a variety of balls of varying size and weight, and dumped them off of the top. They all landed at the base of the building at the same time (legend says that the demonstration was witnessed by a huge crowd of students and professors). Aristotle was wrong.

A modern-day professor who managed to successfully show that, say, Isaac Newton was in error would immediately be granted a lifetime contract. Of course, that's assuming that the professor published results, showing a theory to explain why Newton was wrong. Galileo had no such theory, and consequently didn't publish his results. He also continued to behave rudely to his colleagues, not a good move for a junior member of the faculty. "Men are like wine flasks," he once said to a group of students. "...look at....bottles with the handsome labels. When you taste them, they are full of air or perfume or rouge. These are bottles fit only to pee into!"

Not surprisingly, U. Pisa chose not to renew Galileo's contract.

Necessity is the Mother of Invention

Galileo moved on to the University of Padua. Though he enjoyed the city itself, finding good friends with whom he could party, by 1593 he found himself in desperate need of additional cash. His father had died, so Galileo was the head of his family, and personally responsible for his family. Debts were pressing down on him, most notably, the dowry for one of his sisters, which was paid in instalments over decades (a dowry could be thousands of crowns, and Galileo's annual salary was 180 crowns). Debtor's prison was a real threat if Galileo returned to Florence.

What Galileo needed was to come up with some sort of device that could make him a tidy profit. A rudimentary thermometer (which, for the first time, allowed temperature variations to be measured) and an ingenious device to raise water from aquifers found no market. He found greater success in 1596 with a military compass that could be used to accurately aim cannonballs. A modified civilian version that could be used for land surveying came out in 1597, and ended up earning a fair amount of money for Galileo. It helped his profit margin that 1) the instruments were sold for three times the cost of manufacture, 2) he also offered classes on how to use the instrument, and 3) the actual toolmaker was paid dirt-poor wages.

A good thing. Galileo needed the money to support his siblings, his mistress (a 21 year old with a reputation as a woman of easy habits), and his three children (two daughters and a boy). By 1602, Galileo's name was famous enough to help bring in students to the University, where Galileo was busily experimenting with magnets.

The Telescope

In Venice on a holiday in 1609, Galileo Galilei heard rumours that a Dutch spectacle-maker had invented a device that made distant objects seem near at hand (at first called

the spyglass and later renamed the telescope). A patent had been requested, but not yet granted, and the methods were being kept secret, since it was obviously of tremendous military value for Holland.

Such an instrument as the telescope would also be valuable to Venice, and the scientist was determined to attempt to construct his own spyglass. After a frantic 24 hours of experimentation, working only on instinct and bits of rumours, never having actually *seen* the Dutch spyglass, he built a 3-power telescope. After some refinement, he brought a 10-power telescope to Venice and demonstrated it to a highly impressed Senate. His salary was promptly raised, and he was honoured with proclamations.

If he had stopped here, and become a man of wealth and leisure, he might be a mere footnote in history. Instead, a revolution started when, one fall evening, the scientist trained his telescope on an object in the sky that all people "knew" must be a perfect, smooth, polished heavenly body--the Moon. We can only imagine his astonishment on finding a surface that was "uneven, rough, full of cavities and prominences." A surface full of features much like those that could be found on Earth. This was tremendously exciting news, although there were still plenty of people who insisted that Galileo Galilei was wrong. Some of their arguments were very clever, like the mathematician who insisted that even if Galileo was seeing a rough surface on the Moon, that only meant that the entire moon had to be covered in invisible, transparent, smooth crystal.

Months passed, and his telescopes improved. On January 7, 1610, he turned his 30 power telescope towards Jupiter, and found three small, bright stars near the planet. One was off to the west, the other two were to the east, all three in a straight line. The following evening, Galileo once again took a look at Jupiter, and found that all three of the "stars" were now west of the planet, still in a straight line!

Observations over the following weeks lead Galileo to the inescapable conclusion that these small "stars" were actually small satellites that were rotating about Jupiter. If there were satellites that didn't move around the Earth, wasn't it possible that the Earth was not the centre of the universe? Couldn't the Copernican idea of the Sun at the centre of the solar system be correct?

Just like any modern scientist, Galileo Galilei published his findings--as a small book titled The Starry Messenger." 550 copies were published in March of 1610, to tremendous public acclaim and excitement. We can imagine what it was like for people--probably something like when people learned that the Earth was round, not flat. Or, more recently, what it was like to discover that our galaxy was only one of billions!

And there were more discoveries via the new telescope: the appearance of bumps next to the planet Saturn (Galileo thought they were companion stars; the "stars" were actually the edges of Saturn's rings), spots on the Sun's surface (though others had actually seen the spots before), and seeing Venus change from a full disk to a sliver of light.

The Vatican's Reaction

The great detective Sherlock Holmes once said that "Whether the Earth goes around the Sun or the Sun around the earth makes not a penny-worth of difference to me or my work." For Galileo Galilei, saying that the Earth went around the Sun made a huge difference, since he was contradicting the teachings of the Church. While some of the Church's mathematicians wrote that his observations were clearly correct, many members of the Church believed that he must be wrong.

In December of 1613, one of the scientist's friends told him how a powerful member of the nobility said that she could not see how his observations could be true, since they would

contradict the Bible. The lady quoted a passage in Joshua where God causes the Sun to stand still and lengthen the day. How could this mean anything other than that the Sun went around the Earth?

Galileo Galilei was a religious man, and he agreed that the Bible could never be wrong. However, he said, the interpreters of the Bible could make mistakes, and it was a mistake to assume that the Bible had to be taken literally. The true meaning of a Biblical verse might not be obvious at all, and wise Church scholars would have to work hard to find the true meanings. After all, a cardinal in the Church itself had once said that the intention of the Holy Spirit is to teach us how one goes to heaven, not how heaven goes! He ended with an explanation of how the miracle could not possibly have taken place if the Sun went around the Earth.

This might have been one of Galileo's major mistakes. At that time, only Church priests were allowed to interpret the Bible, or to define God's intentions. It was absolutely unthinkable for a mere member of the public to do so.

And some of the Church clergy started responding, accusing him of heresy. One friar quoted from the New Testament "O ye men of Galilee, why stand ye gazing up into heaven?" Another churchman went to the Inquisition, the Church court that investigated charges of heresy, and formally accused Galileo. This was a very serious matter. In 1600, a man named Giordano Bruno was convicted of being a heretic for believing that the earth moved about the Sun, and that there were many planets throughout the universe where life--living creations of God--existed. Bruno was burnt to death.

This time, Galileo was found innocent of all charges, and cautioned not to teach the Copernican system. 16 years later, all that would change.

The Final Trial

The following years saw Galileo move on to work on other projects. With his telescope he watched the movements of Jupiter's moons, wrote them up as a list, and then came up with a way to use these measurements as a navigation tool. There was even a contraption that would allow a ship captain to navigate with his hands on the wheel. That is, assuming the captain didn't mind wearing what looked like a horned helmet!

As another amusement, Galileo started writing about ocean tides. Instead of writing his arguments as a scientific paper, he found that it was much more interesting to have an imaginary conversation, or dialogue, between three fictional characters. One character, who would support Galileo's side of the argument, was brilliant. Another character would be open to either side of the argument. The final character, named Simplicio, was dogmatic and foolish, representing all of Galileo's enemies who ignored any evidence that Galileo was right. Soon, he wrote up a similar dialogue called "Dialogue on the Two Great Systems of the World." This book talked about the Copernican system.

"Dialogue" was an immediate hit with the public, but not, of course, with the Church. The pope suspected that he was the model for Simplicio. He ordered the book banned, and also ordered the scientist to appear before the Inquisition in Rome for the crime of teaching the Copernican theory after being ordered not to do so.

Galileo Galilei was 68 years old and sick. Threatened with torture, he publicly confessed that he had been wrong to have said that the Earth moves around the Sun. Legend then has it that after his confession, Galileo quietly whispered "And yet, it moves."

Unlike many less famous prisoners, he was allowed to live under house arrest in his house outside of Florence. He was near one of his daughters, a nun. Until his death in 1642, he continued to investigate other areas of science. Amazingly, he even published a book on force and motion although he had been blinded by an eye infection.

The Story Continues...

The Church eventually lifted the ban on Galileo's Dialogue in 1822--by that time, it was common knowledge that the Earth was not the centre of the Universe. Still later, there were statements by the Vatican Council in the early 1960's and in 1979 that implied that Galileo was pardoned, and that he had suffered at the hands of the Church. Finally, in 1992, three years after Galileo Galilei's namesake had been launched on its way to Jupiter, the Vatican formally and publicly cleared Galileo of any wrongdoing.

Reference

The Galileo Project
http://galileo.rice.edu/
The Galileo Project is a source of information on the life and work of Galileo Galilei (1564-1642).

A mind that is stretched by a new experience can never go back to its original shape

Oliver Wendall Holmes

Program Descriptions

Skills Based Workshops

Students will be given explicit opportunities to gain life skills in workshops based on ones that have been offered in the Advance program over the past four years. These skills will be continually practised and emphasized throughout the Galileo Program. Students will reflect on their understanding and development in each area through set activities and through their portfolio.

These workshops are as follows

- **Understanding Self**
  Reflecting on identity/thinking and learning preferences

- **Connecting with My Community**
  Examining the role local community's play in social cohesion and well being. What contributes to a healthy, sustainable community?

- **Communicating effectively**
  Listening, questioning, non verbal communication, tone
  What is effective communication and why is it important
  Appropriate communication

- **Working in Teams**
  Roles people play in teams /how teams develop and flourish
  Dealing with difficult people and situations

- **Reflecting on Projects and Experiences**
  Ongoing reflection as central to life long learning
  Why it's important. Developing strategies to encourage it

- **Developing a Resume**
  Incorporating skills acquired in the Galileo program with other student experiences and skills

Acquiring specific life skills will be offered in the form of

- **First Aid –Course in Pulmonary Resuscitation**

- **Food Handling Certificate**

- **Health related workshops –sexuality etc**

Motivational Speakers

On topics such as resilience, achieving personal best, leadership, current affairs will be integrated into the program

Community Team Project

This is a self directed team task where student spend 12 hours involved in a community project.

Often called service learning the emphasis is on promoting cooperative, life long skills within civics and citizenship framework. The community team project emphasizes the importance of living within a local and global community context and highlights the responsibilities we have as human beings to contribute to each others well being .
The projects offer opportunities to explore a variety of environmental and social issues and give students experience in real life situations that promote skills such as teamwork, communication, project management, and community development.

The community placements are positive and relevant to students, who middle years research has confirmed want opportunities within the curriculum to meaningfully contribute to their world.

The community team project will be modeled on the successful Advance program which has run at UHS over the past four years. It may take the form of the following activities

Community Volunteering
Peer Mentoring/project involvement at nearby Primary schools
Carlton PS/Carlton Gardens at Ascot Vale Special School /Nth Melbourne PS

Environmental Volunteering
Participation in greening and revegetation programs in partnership with community organizations –Royal Park

Student Leadership
Initiating whole school activities, campaigns, projects at University High which benefit the students and school community

Advocacy
Campaigns and Event organization/ Fund raising around social issues to raise awareness
Make Poverty History /Environmental Issues

Social Research
Research on an issue and the development of recommendations eg
Youth issues /environmental issues / community issues

The Rich Task Component

Rich tasks form one element of the Galileo Program. They are tasks of varying length (in Queensland some schools are structured around the teaching of four rich tasks a year, and nothing else) and they draw upon pedagogy which emphasizes differentiated learning, learning styles, multiple intelligences, experiential and interactive learning, problem based learning, collaborative learning, learning about thinking. As such, they need to be relevant to the lives of students and linked with their emotional intelligence.

Rich tasks involve the development of many skills like problem solving, principles of organizing and scheduling, research and reflection.

The TPLT has gathered together and boxed a large number of rich tasks which are ready to be used by teachers in the program. There will be many more to come in the future. These tasks range across many domains of teaching and learning and can be approached and completed in a variety of fashions. Some of the tasks are interactive computer programs.

Tasks prepared to date are as follows:

- **Mission Possible: Making Poverty History**
- **Elevator to Space**
- **Storybook Gardens**
- **Council of all Beings**
- **Science and Ethics Confer**
- **Improving Wellbeing in the Community**
- **Opinion Making Oracy**
- **Personal Career Development Plan**
- **International Trade**
- **What Is Happiness, Using Epicurean Reasoning**
- **Perimeters**
- **Something to Say**
- **Dilemma**
- **Take Me to the City**
- **An Issue of Ethics**
- **Christmas in Cronulla**

The Melbourne Roam

Context
The University High School is in a most privileged geographical position located in close proximity to the inner-city and with easy access to public transport. The new Year 9 program ensures that all students have the opportunity to explore, discover and learn from all that Melbourne has to offer

The Tasks
Dotted throughout the Year 9 program are a variety of "roams". Varying in scope and focus, the idea of each roam is to allow students to explore specific aspects of their city. Explicit direction will be given for a variety of tasks to complete in order to enrich each student's understanding of the particular aspect they are exploring.

The Skills
The idea of these sessions is to help students develop the capacity to:

- **Work well in teams**
- **Interact with the wider community**
- **Navigate**
- **Become increasingly independent learners**
- **Explore**
- **Become aware of community resources**

The Roams
The roams will encourage students to look at the city through a variety of "learning lenses." Some of the roams will be structured to look at the following:

- **Public Places and Interesting Spaces**
  Looking at how architecture and design impacts on how we experience the city.
- **Kulin Nation**
  Exploring Melbourne's multi-layered indigenous past and present
- **This Sporting Life**
  Looking at how Melbourne's rich sporting history and present impacts on our lives and culture.
- **Living to Learn**
  Looking at the amazing learning facilities in our precinct – from universities to the State Library helping students discover for themselves all that's on offer
- **Urban Nature**
  Discovering how the natural world and city life can co-exist and grow
- **Show me the Money**
  Exploring the financial world – from the impact of The Great Depression to the very pulse of capitalism – the stock exchange.
- **Culture Club**
  Exploring the plethora of ways Melbourne expresses, entertains & explores through a variety of arts
- **A Spiritual Experience**
  Looking at the array of different religious experiences found in the city centre
- **Change Agents**
  Looking at the politics of Melbourne – past, present, future formal and informal
- **Judge and Jury**
  Looking at the law and processes in Melbourne – police, courts and the lock-up

The Residential Team Experience

Location
Grampians or Wilsons Promontory: camping grounds

Rich Tasks
Students will be organised into groups of 5. These groups will be responsible for preparing a rich task. Rich task will relate to theme of Nature and the Environment.

Food and Shelter
- Students to sleep in tents (in Rich Task groups).
- Students to bring and prepare their own food (in Rich Task groups).

Timetable

Day 1
- Travel by bus to location
- Set up camp
- Lunch
- Indigenous ed. workshop – eg. managing the environment
- 2 hour bushwalk
- Dinner
- Prepare for presentation of rich task

Day 2
- Breakfast
- 4 hour outdoor activity
- Lunch
- Groups 1-4 present rich task
- Dinner
- Groups 5-7 present rich task

Day 3
- Breakfast
- Pack up camp
- Groups 8-10 present rich task
- Lunch (this could be at a café)
- 2 hour outdoor activity
- Travel by bus back to school

Resources
Rich tasks: *The Weather Makers* by Tim Flannery.

What each must seek in his life never was on land or sea. It is something out of his own unique potentiality for experience, something that never has been and never could have been experienced by anyone else.

Joseph Campbell
Year 9 UHS Student 2006