

STEM SISTAS SHARK TANK

Lesson Plan for Year 8 STEM Sistas Immersion

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OVERVIEW & PURPOSE

- 2 x full days of immersing Year 8 into a STEM based activity
- All within Term 2

STRATEGY DESCRIPTION

- Students are placed in groups of 5
- Ss work together to produce a product using only recyclable materials
- Ss must have a job role and it must improve the quality of AGHS in some way
- Ss will market their final prototype to a board of directors- Principal, Deputies, STEM team of teachers with a fully prepared marketing campaign

STRATEGY OR PROJECT TITLE

- STEM SISTAS

TARGET YEAR GROUP(S)

- Year 8 for the STEM Academy initiative

SCIENCE OUTCOMES

- SC4 - 5WS (WS 5.3)
- SC4 - 8WS (WS8 ABC)
- SC4 - 9WS (WS9 A>D)
- ES3 (A,B,D,E)

MATHEMATICS OUTCOMES

- MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols
Drawing diagrams of models and using appropriate symbols to express mathematics used
- MA4-2WM applies appropriate mathematical techniques to solve problems
Identify mathematical processes required to work through elements of project
- MA4-3WM recognises and explains mathematical relationships using reasoning
Uses mathematics to evaluate / explain the impacts of their concept
- MA4-5NA operates with fractions, decimals and percentages
Calculation of discounted prices / percentage of budget spent
- MA4-6NA solves financial problems involving purchasing goods
Budget of expenditure using spreadsheet
- MA4-7NA operates with ratios and rates, and explores their graphical representation
Scale drawing of model
- MA4-8NA generalises number properties to operate with algebraic expressions
- MA4-10NA uses algebraic techniques to solve simple linear and quadratic equations
Develop a formula to explain expenditure and potential cost
- MA4-12MG calculates the perimeters of plane shapes and the circumference of circles
Links to scale drawing of model through actual measurement of materials
- MA4-13MG uses formulas to calculate the areas of quadrilaterals and circles, and converts between units of area
- MA4-14MG uses formulas to calculate the volume of prisms and cylinders, and converts between units of volume
Volume of recycled material used
- MA4-20SP analyses single sets of data using measures of location, and range
Calculations of statistics to analyse trials / survey results of concept

TAS OUTCOMES

- 4.1.1, 4.3.1, 4.2.1, 4.6.2

PROJECT CONTACT PERSON

- Paul Devonshire

DESIGN SITUATION

A group of numbers 1-5 will form a company who bases their projects on innovation and sustainability. Each company is provided a designated amount of Asquith Dollars to fund the companies project.

DESIGN BRIEF

You have been commissioned by AGHS to develop a product that improves AGHS in some way in one or more of the following manners:

- Educationally
- Physically
- Socially
- Emotionally

You must only use the recycled resources available that include the following:

- Egg Cartons
- Milk Bottles
- Aluminium Cans
- Newspaper
- Plastic punnets and food packaging
- Cardboard boxes
- Plastic bottles and containers
- Recycled Paper
- Shredded Paper

Additional to the recycled materials, you will also have access to:

- Scissors
- Hot glue gun
- Masking Tape
- Electrical Tape
- Stanley Knife
- Rulers

You and your team of innovators must design and construct a prototype in the time frame given. The design will need to be marketed and pitched on the STEM Sistas Shark Tank. Your company will have the opportunity to receive the following awards:

- STEM Sista Investment Award; most Asquith dollars invested by STEM industry professionals as well as parent visitors. Parents will be allocated \$1500 each to invest. STEM investors will be allocated \$10 000.

You will also have the opportunity to purchase specialised subject specific lessons throughout the 2 days, taught by your teachers.

Everything listed above; recycled resources, additional resources and lessons are only accessible using your Asquith dollars. The costing of each is provided in your booklets and summarised here:

- Egg Cartons = \$3

DESIGN CONSTRAINTS

- Only resources supplied can be used
- Time; must be constructed in the 2 days allocated
- Designated Asquith Dollars cannot be exceeded
- Groups must be made up of a number 1-5 (no double up of numbers)
- Marketing pitch will take place on:
-

CRITERIA TO EVALUATE SUCCESS

In order for your companies project to take out the STEM Sistas Business Idea of the Year Award it will need to meet the following criteria:

- **Completed and pitched within timeframe**

- **Design to be justified through Science, Technology and Mathematics outcomes**
- Physical prototype using only provided resources constructed
- **Innovative design idea**
- Must improve AGHS in one of the categories; Physical, social, education and emotionally
- Company budget recording on Excel spreadsheet and presented in marketing pitch
- Scaled drawing of design prototype
- Volume of recycled material calculations
- Justification of the impact of recycled material wasn't being recycled and left in the environment
- Evaluate energy efficiency of production and recycling material.
- Engaging, persuasive marketing campaign that includes company logo and multimedia presentation

SCIENCE LESSONS TO SELL

- Safely using a glue gun
- Safely using soldering equipment
- Explore the humans use resources from the Earth
- The influence of human activity on the surface of the Earth and the atmosphere.

MATHEMATICS LESSONS TO SELL

- Creating a budget
- Using a spreadsheet package for algebraic calculations
- Scale drawing

TAS LESSONS TO SELL

- Web design
- Logo design
- Idea generation
- Construction Techniques
- HS; Supervision of tools
- Video creation/editing

GROUP JOBS ROLES AND RESPONSIBILITIES

- 1 x Graphic designer/artist
- 1 x Finance officer
- 1 x Engineer
- 1 x Marketing campaigner
- 1 x General Manager

STEM DAY OUTLINE

<h1 style="text-align: center;">DAY 1; Week 5</h1> <h2 style="text-align: center;">Wednesday 30th May, 2018</h2>	
TIMING	ACTIVITIES
PERIOD 1	<ul style="list-style-type: none"> • Teacher information session; what is STEM Sistas, what is the project
PERIOD 2	<ul style="list-style-type: none"> • Idea generation; dreams and gripes (TAS) • What do you want to achieve? What category of AGHS will it improve?
RECESS	
PERIOD 3	<ul style="list-style-type: none"> • Sketching design ideas, finalising designs • Marketing campaign idea generation; brand name decided, logo sketches begun,
PERIOD 4	<ul style="list-style-type: none"> • Construction
LUNCH	
PERIOD 5	<ul style="list-style-type: none"> • Construction • Marketing campaign development

DAY 2; Week 8

Thursday 21st June, 2018

TIMING	ACTIVITIES
PERIOD 1	<ul style="list-style-type: none"> • Prototype building • Marketing campaign development • Finance officer compiling spreadsheet
PERIOD 2	<ul style="list-style-type: none"> • Prototype building • Marketing campaign development • Finance officer compiling spreadsheet
RECESS	
PERIOD 3	<ul style="list-style-type: none"> • Finalise budget spreadsheet • Finalise design sketches • Finalise marketing campaign; logo and multimedia presentation
PERIOD 4	<ul style="list-style-type: none"> • STEM Sista Shark Tank evaluation (WWW, EBI) • STEM Sista future project ideas
LUNCH	
PERIOD 5	<ul style="list-style-type: none"> • Market boards and resources set up for Shark Tank display

STEM SISTA SHARK TANK EVENING;

Thursday 21st June, 2018

TIMING	ACTIVITIES
3:30 - 4:30 pm	<ul style="list-style-type: none"> • Project display • Companies marketing projects to investors • Parent and STEM investors choose where to invest their money
4:30 - 5:00 pm	<ul style="list-style-type: none"> • Guest Speaker • STEM Sista student speech (what they enjoyed, how they found it challenging, if they are inspired by the STEM Sista Shark Tank, what jobs they may look into in the future in STEM etc)

	<ul style="list-style-type: none"> • STEM Sista helpers count investors money behind the scenes
5:00 - 5:30 pm	<ul style="list-style-type: none"> • Winners of STEM Sista Investor Awards announced; 1st, 2nd, 3rd • STEM gifts presented (Barista Sista vouchers, ??)
	<ul style="list-style-type: none"> • STEM Sista Shark Tank evaluation (WWW, EBI) • STEM Sista future project ideas
	<ul style="list-style-type: none"> • Market boards and resources set up for Shark Tank display