ALTERNATIVE ENERGY SOURCES

Material/Product Technology

PLANNING

- **Skill Development** (practical exercise to use machinery safely)
- **Skill Development** – Self Assessment sheet (get students to reflect)
- **Tech cycle** (then apply this to real world situation)
- **Introduce Issue / Class Brief**
- **Stakeholder Profile**

  Initial Brief
- **Time Planning**
- **History** (social links and influences) (weather vanes versus weather stations)
- **Research existing solutions** (evaluation)
- **Needs/Opportunities** – overview specs
- **Presentation of Drawing / Concepts**
- **Development / mock-ups** (evaluation)
- **Materials research**
- **Final Brief/Specs**
- **Working Drawing / Construction Flow Chart**
- **Manufacturing**
- **Self Assessment Sheet on Skills**
- **Photo/evaluation** (A3 card sheet)
- **Assessment**
- **(Small unit as extension work)**
- **Glossary of Terms**

Knowledge and Skills *

we would like to see from students

KNOWLEDGE ✶

- **Structures**
- **Simple Machines**
- **Mechanisms**
- **Types of motion**

} Touch on to make students aware and to show examples.

✶ • **Materials – teach materials and properties**

i.e.
- availability
- cost
- stock sizes
- ease of working
- aesthetics
- the righ material for the job
- how well it will last (properties/chatracteristics/appearance)

✶ • **Alternative energy**

- the requirements of society today
- why the need and future trends
- have a focus on wind energy

SKILLS ✶ • **Must cover from Year Nine**

- marking out
- cutting out
- and finish

} hand tools

• **More processes need to be:**

Welding
- oxy-acetylene – brazing
- brace welding
- electric (ARC) welding (MIG)

Machining
- centre lathe work
- machines
  - power cutting
  - grinding/sanding
  - drilling

ALTERNATIVE ENERGY

UNIT OUTLINE

YEAR 10

1. • Introduction to Unit • Safety (gas and machines) • Video (safety)	2. • Safety Booklet for Display Board 	3.	4.
5. • Structure and Mechanisms	6.	7. • Skills Development Project (Balancing Toy)	8.
9. • Relate Product to Technology Cycle	10.	11.	12.
13.	14. • Recap - marking out - cutting out - finishing and machine use	15.	16.
17.	18. • Teach Skills - Brazing/welding - Machining (centre lathe)	19.	20.
21.	22.	23. Workshop	24.
25.	26.	27.	28.
29.	30	31.	32.
33.	34.	35. • Evaluation of project • Formative assessment • Self assessment	36.
37. • Project 2 (main project) • Teach Tech Cycle • Example – clickview	38. • Introduction Issue/Brief • Stakeholder's profile • Finish – homework.	39. • Initial Brief • Planning (GANT)	40. • Research

41.	42. • Needs/Opportunities • Specs (what are they?) • Overview specs • Stakeholder's needs	43. • Drawing/Sketching • Techniques	44.
45. • Concepts	46. • Development	47. • Mocking-up • Templates	48. • Evaluation • Fitness for Purpose • Stakeholder Feedback
49. • Working Drawing • Formal, half scale	50.	51. • Final Brief • Specifications • Construction Flow Chart	52. • Concepts
53. • Workshop	54.	55.	56.
57.	58. • Study on Material and Testing	59.	60.
61.	62.	63.	64.
65.	66. • Study on Alternative Energy (Homework)	67.	68.
69.	70.	71.	72. • Finishing off (painting skills)
73.	74.	75. • Presentation / Photo Board	36.
77.	78. • Assessment • Student report back to class.	79. • - Extra – Glossary of Terms - students produce word search.	80.

YEAR 10

ALTERNATIVE

Lessons 1 – 8

Lesson Sequence	Resources	Learning Intentions
Introduction to Course • Talk about two term format • Main topic being Material Technology with alternative energy focus (knowledge of societal)	• Term One Student Booklet • Clear folders	• To give clear overview of unit and intentions.
Safety • Recap on safety in workshop (general) • Show video on safety • Focus on gas/electric welding and machines • Students produce safety pamphlet for storyboard Term 2.	• Workshop equipment and processes • Hand-out on Safety • TV/DVD • Example of layouts – hand-outs	• Students aware of surroundings and dangers that lie within. • Understand each student responsible for own actions. • Tech toy techniques.
Structures and Mechanisms • Teach structures • Simple machines • Mechanisms • Types of motion.	• Overheads for structures • Hand-outs and worksheets for rest.	• To gain awareness of structures and mechanisms and how simple machines work.
Introduce Skill Based project (Balancing toy) • Introduce Technology Cycle and Project • Talking to project re cycle (balancing toy)	• Hand-outs tech cycle • Work booklet Project 1	• For them to learn skills required to take through to Year 11, Level 1.

YEAR 10

ALTERNATIVE

Lessons 9- 65

Lesson Sequence	Resources	Learning Intentions
• Research existing solutions from booklet • Teach Design Process (cycle) • Develop their own solution.	• Booklet • " • "	• Design Process • Students come up with own designs
Skills Development • Recap marking out, cutting and finishing techniques • Teach brazing, machining	• Hand-outs / demonstrations • Gas plant and machines	• Students able to braze and machine correctly and safely and apply to their own project.
Evaluation of Project	• Evaluation sheet.	• To give feedback to the student and teacher.
FINISH STAGE 1, TERM 1		
STAGE II	Technology Cycle off Computer	
Materials Study • Teach materials and properties	• Hand-outs and worksheets	• To gain an awareness of types of materials and properties and then uses in everyday life.

YEAR 10

ALTERNATIVE

Lessons 66 - 80

Lesson Sequence	Resources	Learning Intentions
Alternative Energy Sources • Types of energy used today. • Brainstorm types of energy • Awareness of effects on society • Effects on the environment and society.	• Hand-outs and chalk and talk • Homework (A4 case study) • Hand-outs. Homework.	• Student to understand energy sources • Tell us what they are • Explain this (what are the effects?)
Finishing Techniques • Types – focus on Painting Techniques - preparation/techniques/masking/waste/storage techniques.	• Hand-outs • "	• Students able to understand and apply techniques of material protection to their own project.
Presentation Board		
Extra • Glossary of Terms	• Word Search	• Learn technological language.