ASTON

Aston Comprehensive School
Design and Technology Department

Keyboard Project

Workbook
2010

My name is:_____

My teacher's name is: Mr. Clarvis

My technology group is:_____

My target level is:_____

Final Assessment

Level achieved:_____

Effort (EGSP):_____

Behaviour for learning (1,2,3,4):_____

*STUDENT'S
PHOTOGRAPH*

Learning Objectives
Be able to identify safety hazards and know how to reduce the risk of injury to self and others

Learning Outcomes

ALL *(Level 4)*
Describe how to behave in a safe way in the workshop,

Identify some of the tools that will be used during the manufacture of the project,

Describe how to use tools safely,

Describe the checks that must be carried out before using equipment.

MOST *(Level 5)*
Identify all of the tools that will be used during the manufacture of the project.

SOME *(Level 6)*
Identify all of the tools that will be used during the manufacture of the project and describe how to use them to other students.
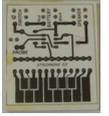
Starter jot spot

Hazard no.	Hazard Description	How hazard can be minimised

E *G* *S* *P* Level: | Comment:

Learning Objectives
Know how to make a PCB, what quality checks need to be made to ensure the quality of a product.

Learning Outcomes

ALL *(Level 4)*
Describe the stages involved in the manufacture of a PCB,

Describe the importance of QA & QC,

Identify the majority of faults on a given PCB.

MOST *(Level 5)*
Identify all faults on a given PCB.

SOME *(Level 6)*
Identify the faults on a given PCB and suggest methods of rectification.

Starter jot spot

Take notes on how a PCB is made by filling in the table

Stage no.	Description
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

E	G	S	P	Level:	Comment:

With the aid of diagrams explain the key points of how a PCB is made

Learning Objectives
Identify and use the appropriate tools to solder components in place correctly

Learning Outcomes

ALL *(Level 4)*
Identify and name the tools used in the construction of a PCB

Describe how to solder a component in place

Identify faulty joints

Solder at least three joints in place

MOST *(Level 5)*
Solder at least five components in place perfectly

Identify faulty joints and describe the reasons for this

SOME *(Level 6)*
Solder ten or more components in place accurately and to a high standard

Identify faulty joints, describe the reasons for this and suggest methods of preventing and remedying the fault.

Can you name the components below?

	Tool Name: _____ What is it used for? _____
	Tool Name: _____ What is it used for? _____
	Tool Name: _____ What is it used for? _____
	Name: _____ What is it used for? _____
	Tool Name: _____ What is it used for? _____

E	G	S	P	Level:	Comment:

Learning Objectives
Know how to identify resistors by their colour coded bands

Learning Outcomes

ALL *(Level 4)*
Describe how resistors are identified

Identify a number of resistors by their colour codes

MOST *(Level 5)*
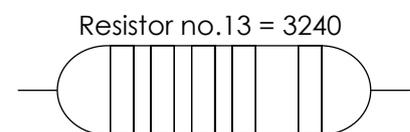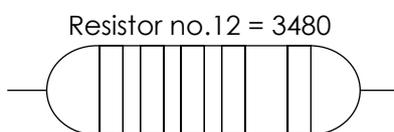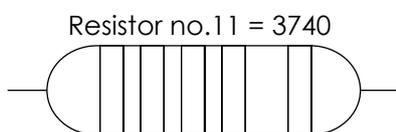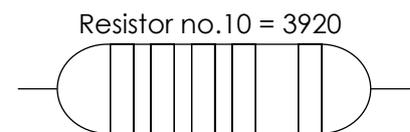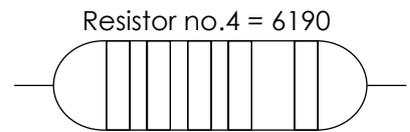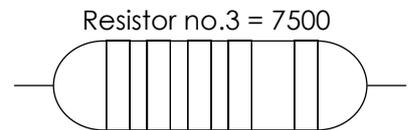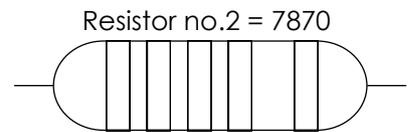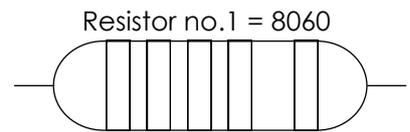Identify most resistors by their colour codes

SOME *(Level 6)*
Identified all resistors and affixed them onto worksheet

Starter jot spot

Use the colour code below to colour in the pictures of the resistors that we will be using.

	BAND 1	BAND 2	BAND 3	BAND 4 Multiplier	BAND 5 Tolerance
BLACK	0	0	0	-	
BROWN	1	1	1	0	+/- 1 %
RED	2	2	2	00	+/- 2%
ORANGE	3	3	3	000	
YELLOW	4	4	4	000,0	
GREEN	5	5	5	000,00	+/- 0.5%
BLUE	6	6	6	000,000	+/- 0.25%
VIOLET	7	7	7	-	+/- 0.1%
GREY	8	8	8	-	+/- 0.05%
WHITE	9	9	9	-	

Resistor no.1 = 8060

Resistor no.2 = 7870

Resistor no.3 = 7500

Resistor no.4 = 6190

Resistor no.5 = 5900

Resistor no.6 = 5620

Resistor no.7 = 5110

Resistor no.8 = 4750

Resistor no.9 = 4220

Resistor no.10 = 3920

Resistor no.11 = 3740

Resistor no.12 = 3480

Resistor no.13 = 3240
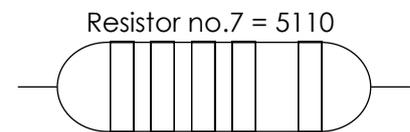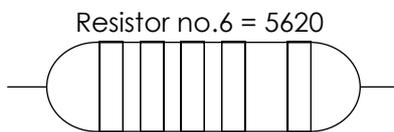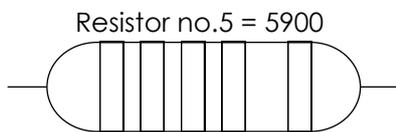
E **G** **S** **P** Level: Comment:

Learning Objectives
Use tools to drill holes in a PCB safely and accurately and solder resistors in the correct locations

Learning Outcomes

ALL *(Level 4)*
Drill accurately at least ten holes in the PCB

Position and solder at least three resistors onto the PCB

MOST *(Level 5)*
Drill at least ten holes ion the PCB

Position and solder at least five resistors onto the PCB
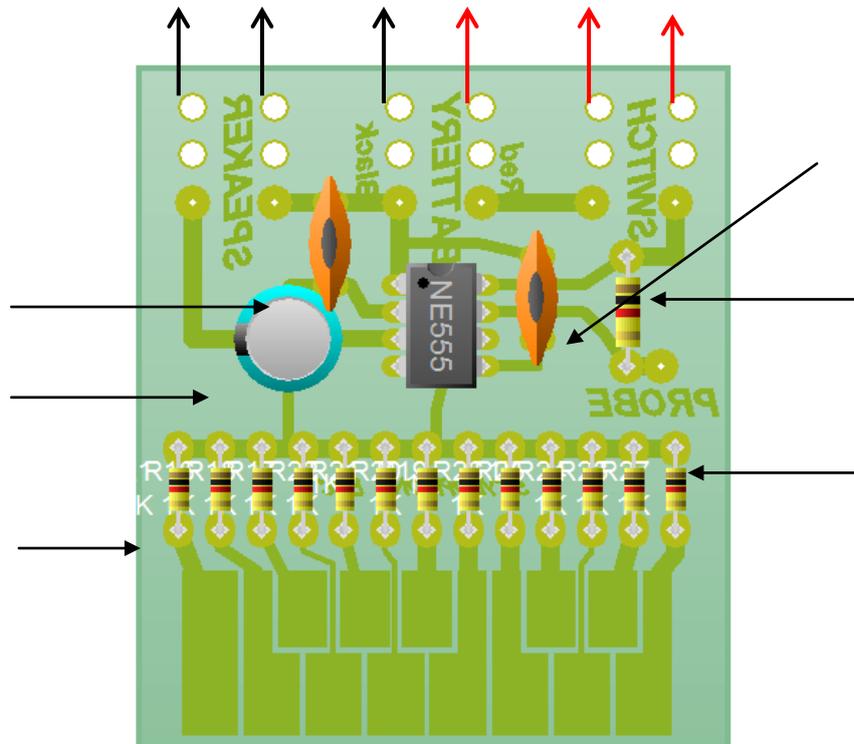
SOME *(Level 6)*
Drill accurately all holes in the PCB

Position and solder more than five resistors onto the PCB

Starter jot spot

The Circuit Board

Printed Circuit Board
(From Above)

Learning Objectives
Know how a resistor and capacitor works and how this affects our project

Learning Outcomes
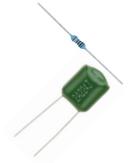
ALL *(Level 4)*
Position the capacitors in the correct places.

MOST *(Level 5)*
Describe how the flow of electricity is limited by the size of the resistor **or** the size of the capacitor.

SOME *(Level 6)*
Describe how the flow of electricity is limited by the size of the capacitor **and** the capacitor.

Component Tick Sheet—Tick of the component parts once each part of finished

Resistors

Resistor 1	☐	Resistor 8	☐
Resistor 2	☐	Resistor 9	☐
Resistor 3	☐	Resistor 10	☐
Resistor 4	☐	Resistor 11	☐
Resistor 5	☐	Resistor 12	☐
Resistor 6	☐	Resistor 13	☐
Resistor 7	☐	Resistor 14	☐

Wires & External Parts

Speaker wires	☐	Speaker soldered	☐
Switch wires	☐	Switch soldered	☐
Battery clip	☐		☐
Probe wire	☐	Probe attached	☐
LED & wires attached	☐	LED soldered onto PCB	☐
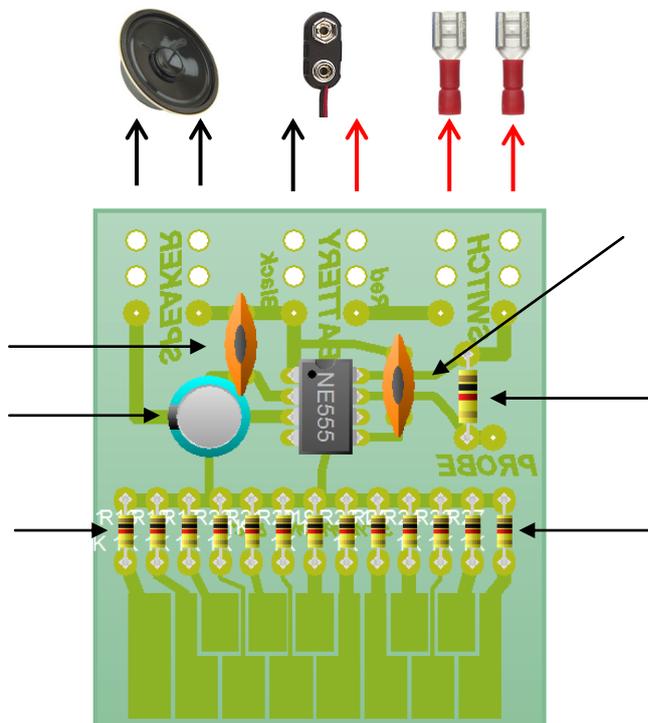
Other Components

DIL Socket	☐
555 Timer chip	☐

Capacitors

Capacitor 1	☐
Capacitor 2	☐
Capacitor 3	☐

Attaching the probe

Stage 1.

Stage 2.

Stage 3.

Stage 4.

Stage 5.

30mm
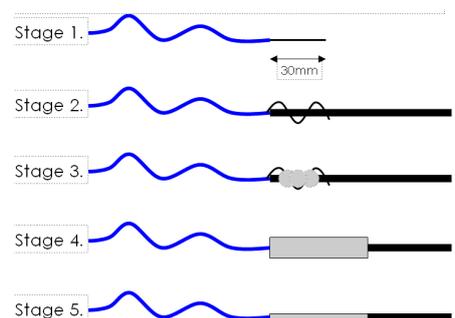
Learning Objectives
Know how to identify polarised components and how to use heat-shrink sleeving.

Learning Outcomes

ALL *(Level 4)*
Identify the anode and cathode of an LED.

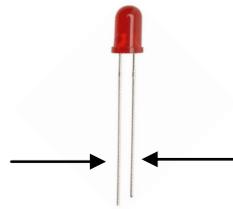Solder the LED, speaker and switch onto the PCB using heat-shrink and tinning wires.

Identify some of the components we have used so far.

MOST *(Level 5)*
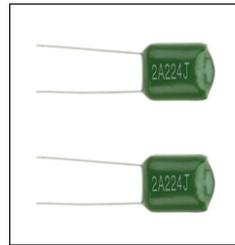Identify the majority of the components we have used so far.

SOME *(Level 6)*
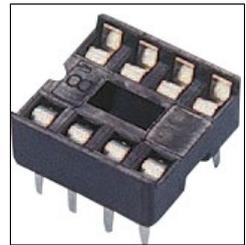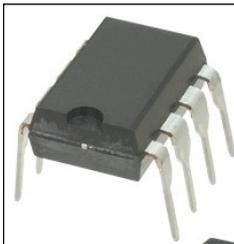Identify all of the components used and describe their function.

Identify these components

_____   _____   _____   _____

_____   _____   _____   _____

_____   _____   _____
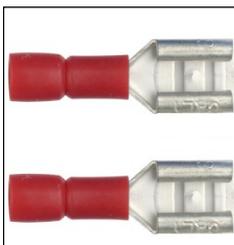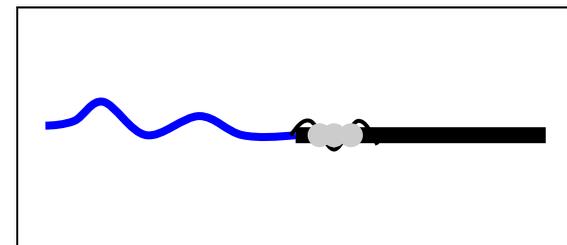
| E | G | S | P | Level: | Comment: |

Learning Objectives
Know the importance of planning and use this skill to develop design ideas

Learning Outcomes

ALL *(Level 4)*
Describe the importance of planning before the manufacture of a product.

Produce a mind-map and mood board of identified topics.

Use hand drawing skills to generate case design proposals.

MOST *(Level 5)*
Produce up to four distinctly different designs.

SOME *(Level 6)*
Produce four or more distinctly different designs.
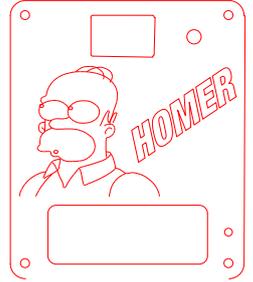
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Mind Map

My Project

E   G   S   P   Level: Comment:

Notes

Notes

Notes

E	G	S	P	Level:	Comment:

Notes

Notes

Notes
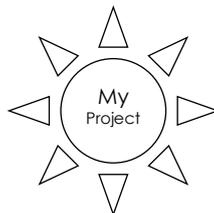
E G S P Level: Comment:

Learning Objectives
Know how to evaluate and develop design ideas.

Learning Outcomes

ALL *(Level 4)*
Describe why it is important to design and plan before making a project,

Evaluate design ideas simply and develop into a case design.

MOST *(Level 5)*
Evaluate the main merits of each design and produce a detailed design

SOME *(Level 6)*
Describe in detail the merits of each design and produce a distinct and detailed design

E **G** **S** **P** Level: | Comment:

CADCAM

Learning Objectives
Understand what is meant by CADCAM & how to apply these techniques to the manufacture of the project.

Learning Outcomes

ALL *(Level 4)*
Describe what CAD stands for,

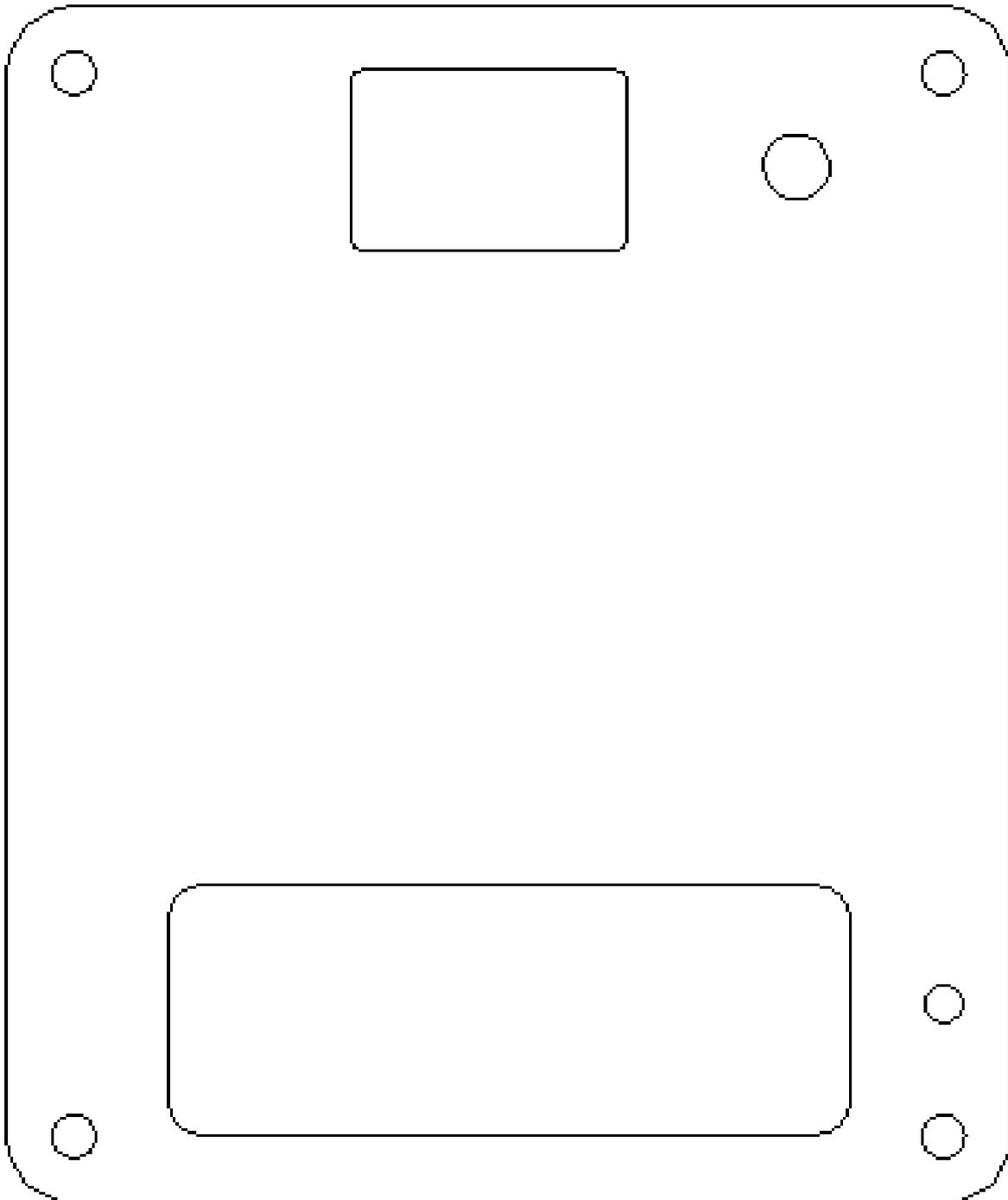Describe what CAM stands for,

Draw basic shapes using 2D Design with guidance,

Trace around a simple graphic using 2D Design.

MOST *(Level 5)*
Describe the advantages of using CAD and CAM over traditional techniques,

Draw basic shapes and develop them further.

Trace around a detailed graphic using 2D Design adding own details.

SOME *(Level 6)*
Identify all of the components used and describe their function,

Trace around a very detailed graphic using 2D design adding own details.

Jot Spot

_____

_____

_____

_____

_____

CADCAM

Learning Objectives
Be able to use CAD software to develop case designs

Learning Outcomes

ALL *(Level 4)*

Use 2D Design to create a simple design adding some extra details such as text.

MOST *(Level 5)*
Use 2D Design to develop detailed designs which reflect which reflect most aspects of your developed design.

SOME *(Level 6)*
Use 2D Design to develop a complex and detailed design which most aspects of your developed designs.

Planning and Manufacture

Learning Objectives
Be able to plan and evaluate the manufacture and use skills to develop the project

Learning Outcomes

ALL *(Level 4)*
Plan the main points of action for the development of the project,

Identify the points of action that need to be developed for next lesson in order to develop the project,

Apply knowledge and skills to complete one on the planning sheet.

MOST *(Level 5)*
Apply knowledge and skills to complete more than one task on the planning sheet.

SOME *(Level 6)*
Apply knowledge and skills to complete more than one task on the planning sheet to a high standard.

Learning Objectives
Be able to evaluate own work and that of others and assess achievement using assessment criteria.

Learning Outcomes

ALL (Level 4)
Evaluate own work and that of others,

Assess own work and that of others to calculate levels of work,

Describe own level of performance.

MOST (Level 5)
Evaluate own work and that of others and give suggestions for improvement,

Describe level of own performance and record and describe how final level could be improved.

SOME (Level 6)
Describe level of own performance and that of others and describe how the final level could be improved.

Final Evaluation—With guidance from your teacher evaluate your performance:

Level:

Comment:

Project Evaluation

What new skills have you learnt by doing this project?

_____
_____
_____
_____
_____
_____

Which part of the project did you find difficult and why?

_____
_____
_____
_____
_____
_____

What changes do you think would make the project more interesting or rewarding?

_____
_____
_____
_____
_____
_____

What did you enjoy most about this project? Any other comments?

_____
_____
_____
_____
_____
_____

E	G	S	P	Level:	Comment: