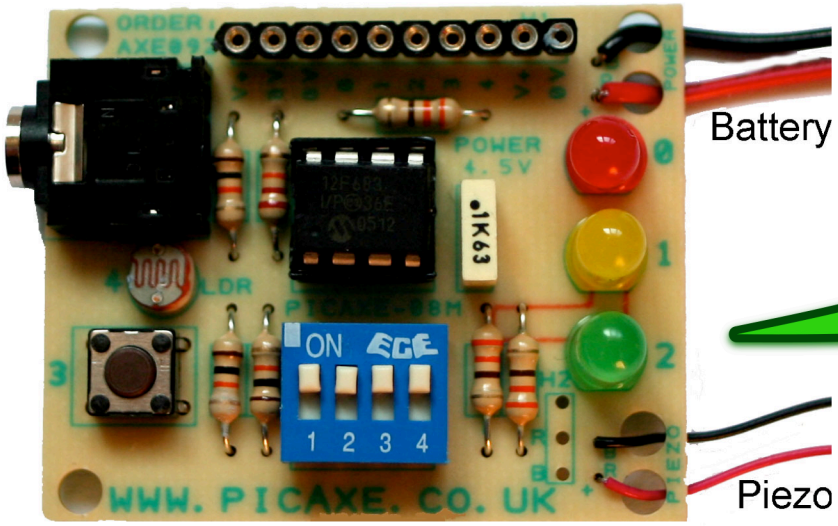
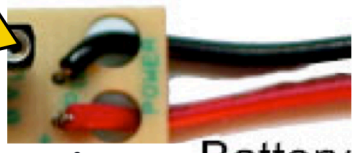
THE SCHOOLS' EXPERIMENTER BOARD STEP-BY-STEP CONSTRUCTION



THIS IS WHAT THE FINAL CIRCUIT BOARD WILL LOOK LIKE.

BUT YOU HAVE TO ADD THE COMPONENTS IN THE RIGHT ORDER.... AND TEST AT EVERY STEP



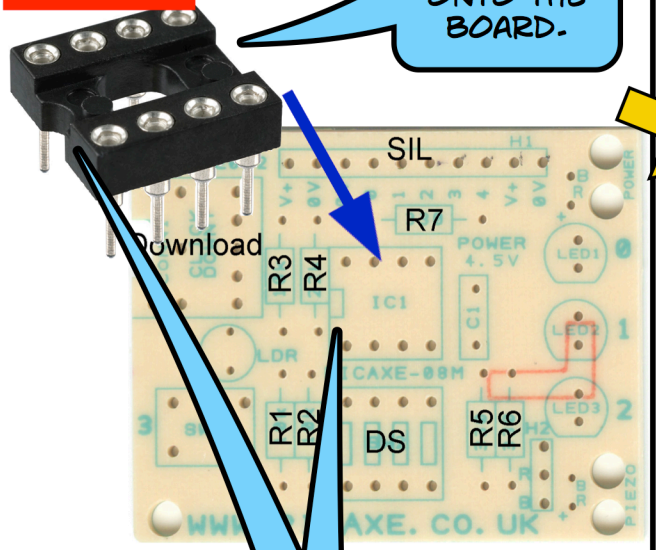
THE BLACK WIRE GOES IN THE HOLE MARKED 'B'.

RED WIRE INTO THE HOLE MARKED 'R'!

FIRST SOLDER IN THE WIRES FOR THE BATTERY CONNECTOR.

DON'T ADD THE ACTUAL CHIP YET!!!

NEXT PLACE THE 8-PIN CHIP SOCKET ONTO THE BOARD.



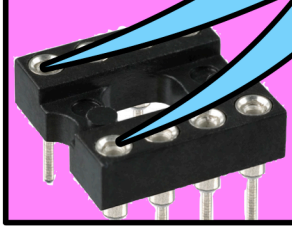
MAKE SURE THE NOTCH AT ONE END OF THE SOCKET LINES UP WITH THE NOTCH ON THE BOARD!!

TEST POINT 1

ASK FOR HELP MEASURING THE VOLTAGE IF YOU ARE NOT SURE.

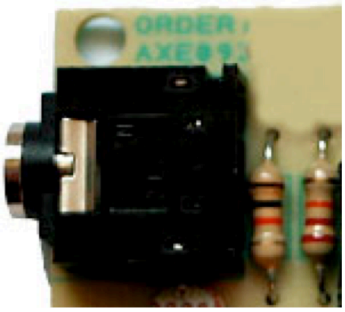
CONNECT A BATTERY PACK TO THE BATTERY

USE A MULTIMETER TO CHECK THE VOLTAGE BETWEEN THESE TWO PINS.
IT SHOULD BE ABOUT **4.5V**



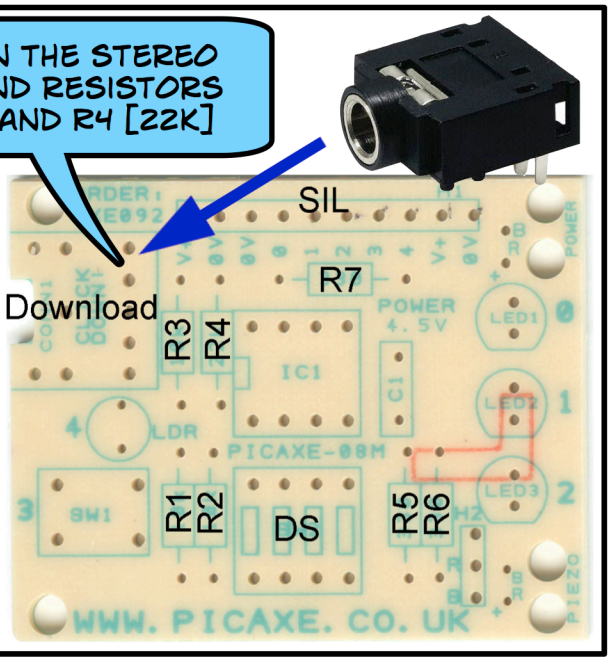
DON'T GO ANY FURTHER UNTIL THIS TEST HAS BEEN PASSED

THE NEXT STEP IS TO ADD THE PROGRAM DOWNLOAD CIRCUIT.



SOLDER IN THE STEREO SOCKET AND RESISTORS R3 [10K] AND R4 [22K]

USE THE RESISTOR COLOUR CODE TO HELP YOU FIND THE RIGHT RESISTORS. ASK FOR HELP USING THE CODE IF YOU ARE NOT SURE.



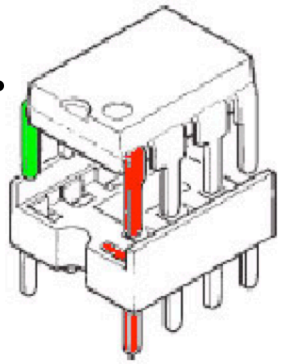
RESISTOR COLOUR CODE

Gold	-	-	÷10	5% tolerance
Black	0	0		
Brown	1	1	0	1% tolerance
Red	2	2	00	
Orange	3	3	000	
Yellow	4	4	0000	
Green	5	5	00000	
Blue	6	6	000000	
Violet	7	7	0000000	
Grey	8	8		
White	9	9		

A 10k resistor

CAREFULLY INSERT THE PICAXE 08M CHIP INTO THE SOCKET.

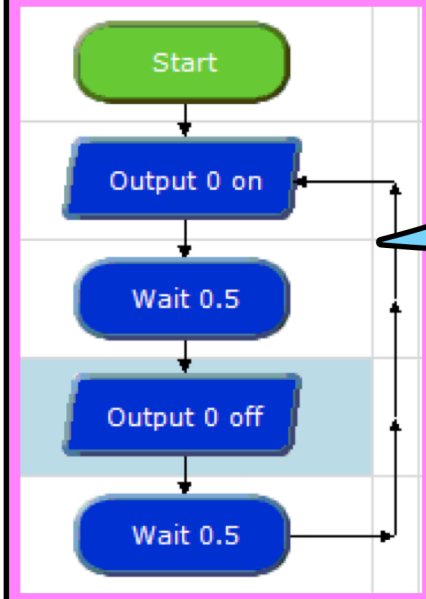
MAKE SURE THE NOTCH ON THE CHIP LINES UP WITH THE NOTCH ON THE



YOU WILL NEED TO USE ***LOGICATOR FOR PICS*** OR ***PICAXE PROGRAMMING EDITOR*** TO DOWNLOAD A PROGRAM INTO A PICAXE CHIP.

ASK FOR HELP IF YOU ARE NOT SURE HOW TO DOWNLOAD A PROGRAM.

TEST POINT 2

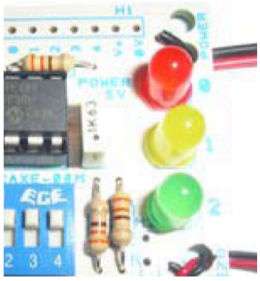


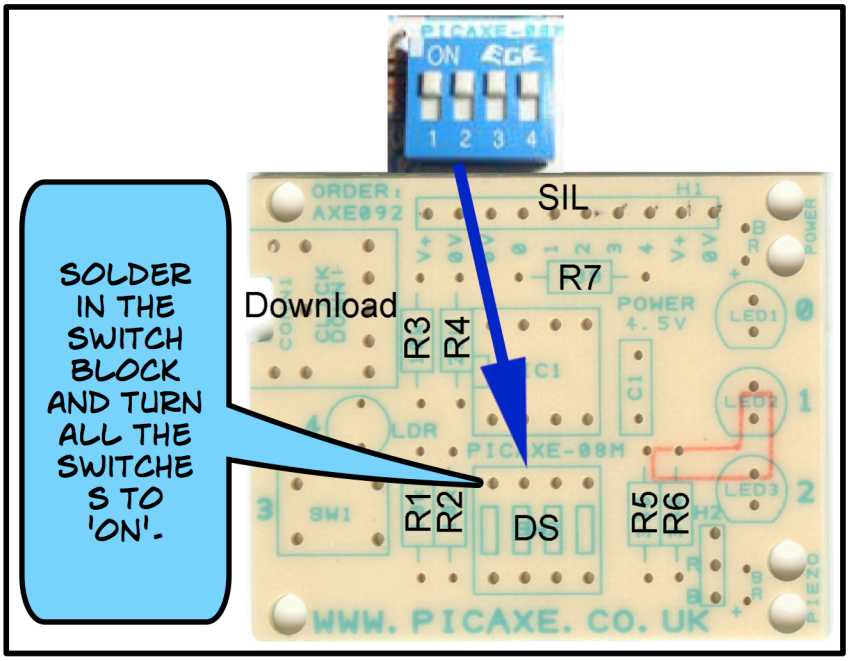
TRY TO DOWNLOAD ***ANY*** PROGRAM INTO THE PICAXE CHIP.

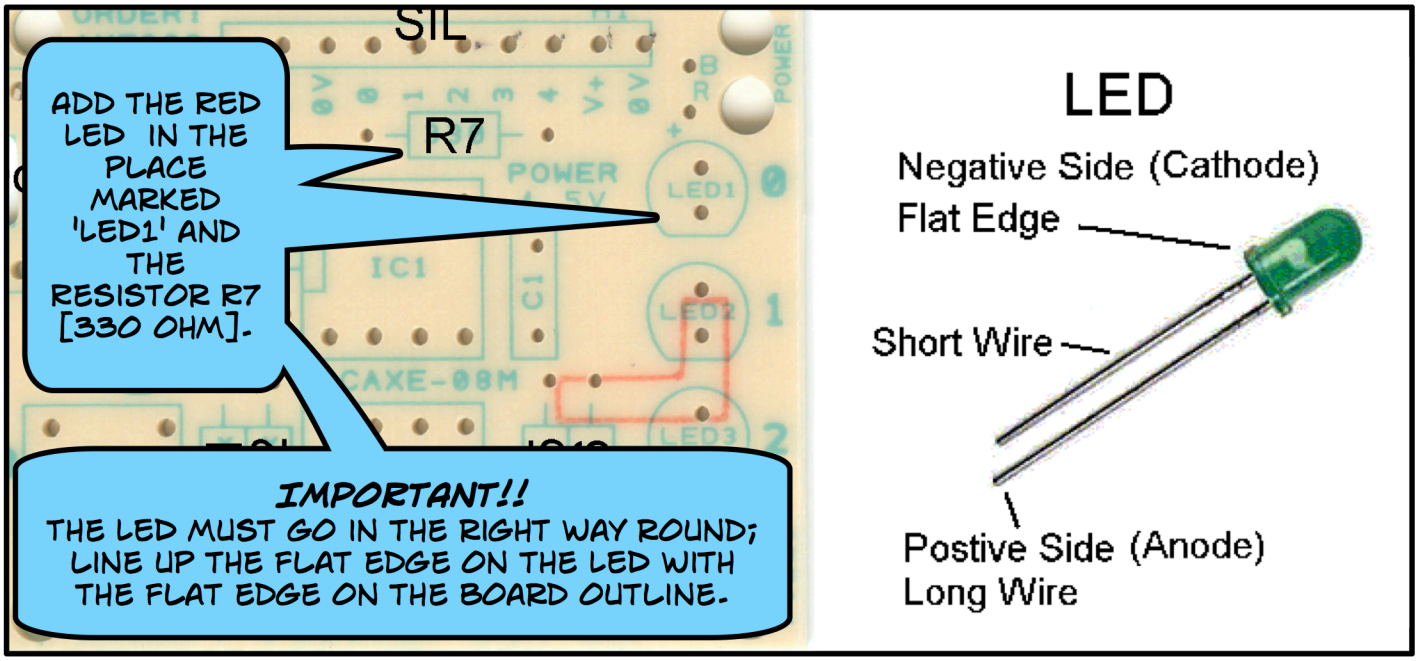
IF THE DOWNLOAD FINISHES SUCCESSFULLY, CARRY ON....

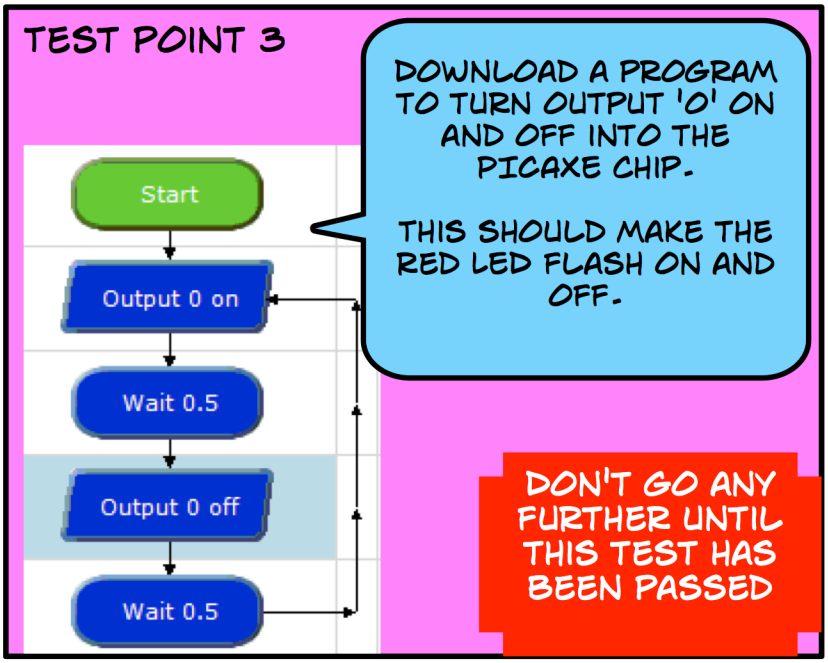
DON'T GO ANY FURTHER UNTIL THIS TEST HAS BEEN PASSED

NOW YOU ARE GOING TO ADD ALL THE OUTPUT DEVICES (THE LEDS AND THE SOUNDER).







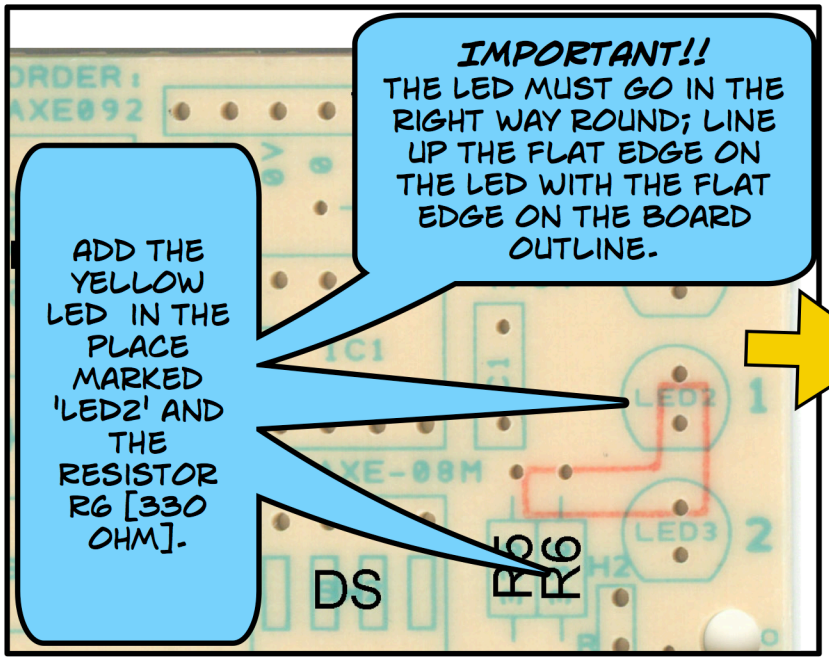


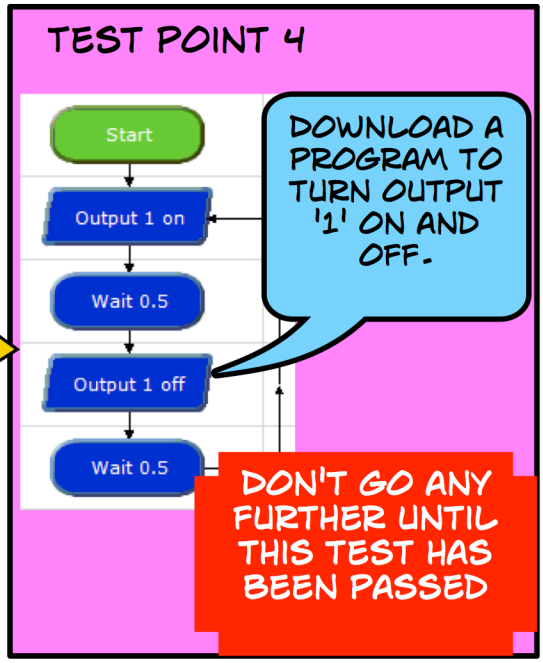
IF YOUR LED TEST FAILS THEN YOU MUST FIND OUT WHAT THE PROBLEM IS BEFORE YOU GO ANY FURTHER.

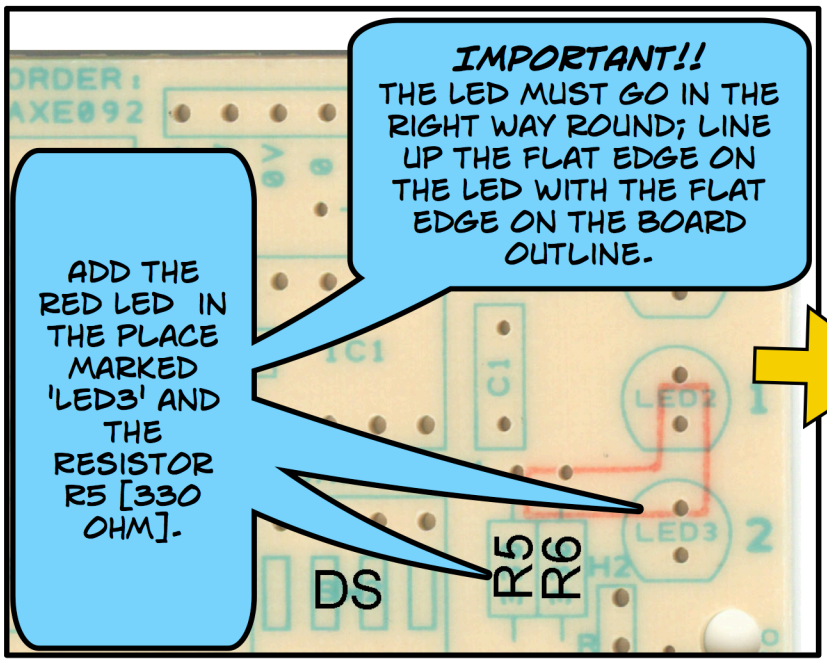
THE MOST LIKELY CAUSES ARE:

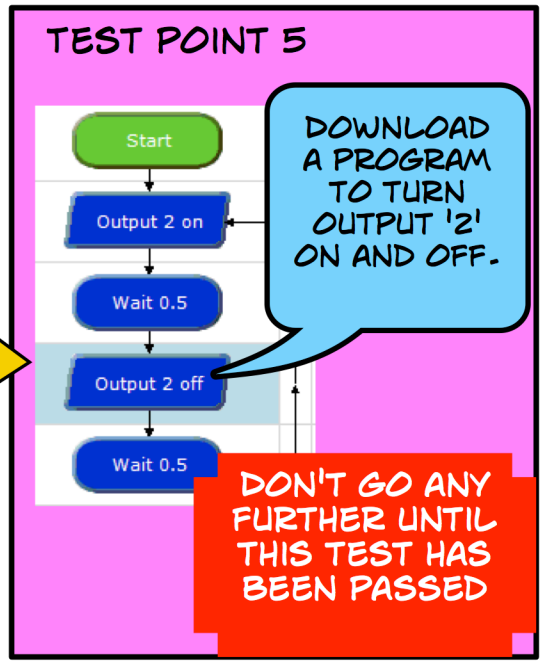
- A PROBLEM WITH YOUR SOLDERING.
- THE LED BEING THE WRONG WAY ROUND IN THE CIRCUIT.

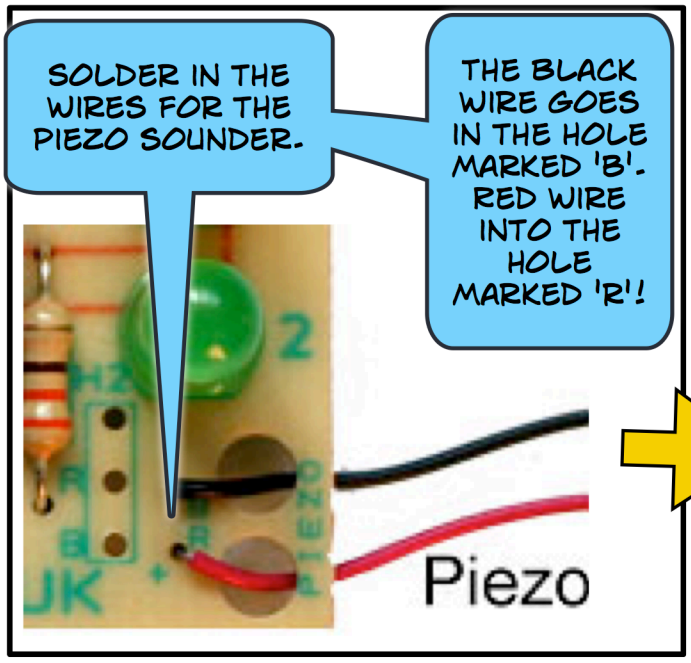
IF YOU NEED HELP, ASK!!

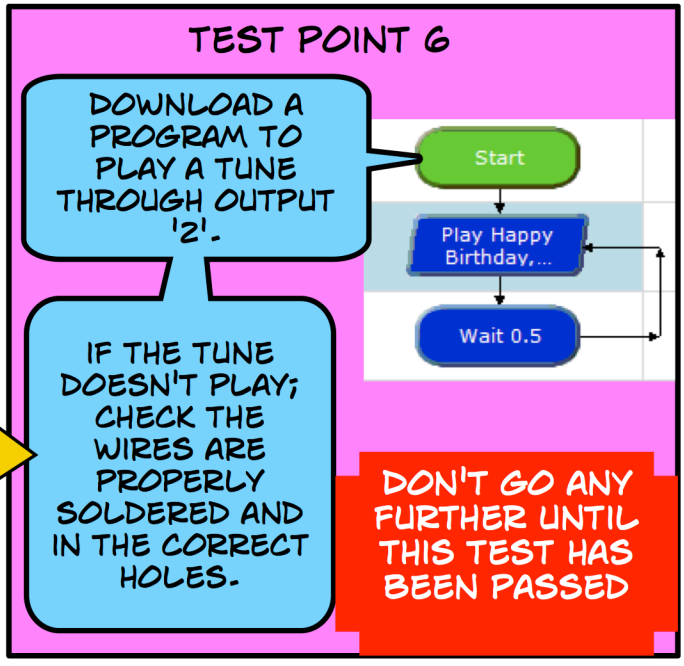

IMPORTANT!!
THE LED MUST GO IN THE RIGHT WAY ROUND; LINE UP THE FLAT EDGE ON THE LED WITH THE FLAT EDGE ON THE BOARD OUTLINE.
ADD THE YELLOW LED IN THE PLACE MARKED 'LED2' AND THE RESISTOR R6 [330 OHM].
DS
R6


TEST POINT 4
Start
Output 1 on
Wait 0.5
Output 1 off
Wait 0.5
DOWNLOAD A PROGRAM TO TURN OUTPUT '1' ON AND OFF.
DON'T GO ANY FURTHER UNTIL THIS TEST HAS BEEN PASSED

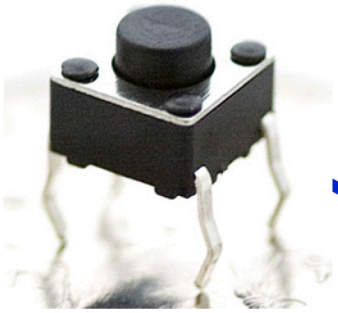

IMPORTANT!!
THE LED MUST GO IN THE RIGHT WAY ROUND; LINE UP THE FLAT EDGE ON THE LED WITH THE FLAT EDGE ON THE BOARD OUTLINE.
ADD THE RED LED IN THE PLACE MARKED 'LED3' AND THE RESISTOR R5 [330 OHM].
DS
R5
R6

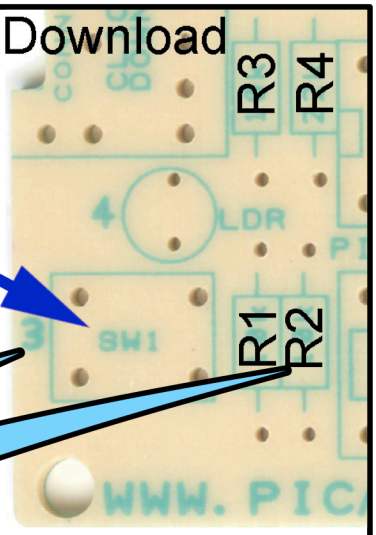

TEST POINT 5
Start
Output 2 on
Wait 0.5
Output 2 off
Wait 0.5
DOWNLOAD A PROGRAM TO TURN OUTPUT '2' ON AND OFF.
DON'T GO ANY FURTHER UNTIL THIS TEST HAS BEEN PASSED


SOLDER IN THE WIRES FOR THE PIEZO SOUNDER.
THE BLACK WIRE GOES IN THE HOLE MARKED 'B'. RED WIRE INTO THE HOLE MARKED 'R'!
Piezo


TEST POINT 6
DOWNLOAD A PROGRAM TO PLAY A TUNE THROUGH OUTPUT '2'.
Start
Play Happy Birthday,...
Wait 0.5
IF THE TUNE DOESN'T PLAY; CHECK THE WIRES ARE PROPERLY SOLDERED AND IN THE CORRECT HOLES.
DON'T GO ANY FURTHER UNTIL THIS TEST HAS BEEN PASSED

NOW YOU ARE GOING TO ADD THE INPUT DEVICES (THE LIGHT SENSOR AND SWITCH).



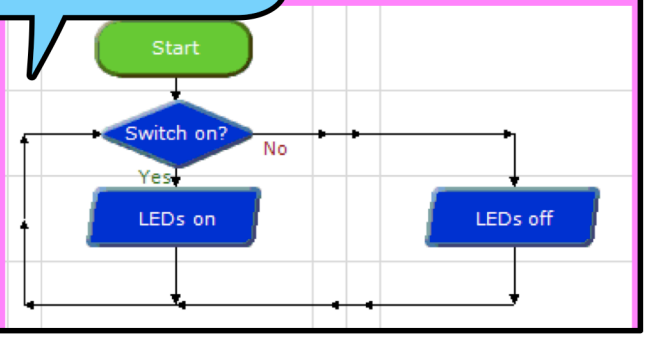


SOLDER IN THE PUSH SWITCH AND RESISTOR R2 [10K].

TEST POINT 7

DON'T GO ANY FURTHER UNTIL THIS TEST HAS BEEN PASSED

DOWNLOAD A PROGRAM TO TEST THE SWITCH; E.G. TURN ALL LEDS ON WHEN THE SWITCH IS PRESSED AND OFF WHEN IT IS RELEASED.

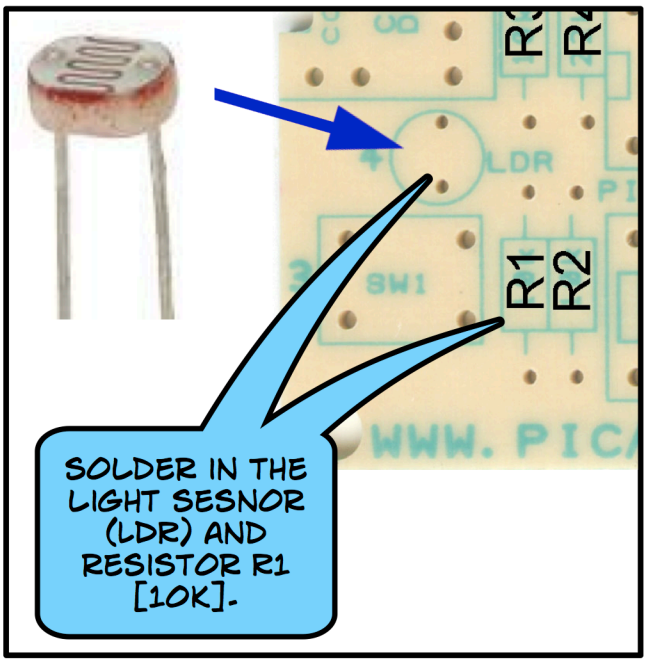


IF AN INPUT TEST FAILS THEN YOU MUST FIND OUT WHAT THE PROBLEM IS BEFORE YOU GO ANY FURTHER.

THE MOST LIKELY CAUSES ARE:

- A PROBLEM WITH YOUR SOLDERING.
- A MISTAKE IN YOUR PROGRAM.

IF YOU NEED HELP, ASK!!

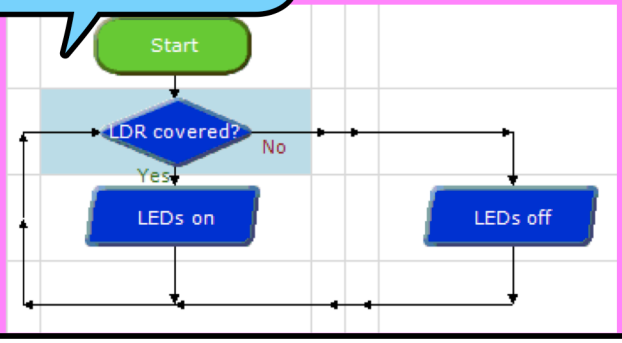


SOLDER IN THE LIGHT SESNOR (LDR) AND RESISTOR R1 [10K].

TEST POINT 8

DON'T GO ANY FURTHER UNTIL THIS TEST HAS BEEN PASSED

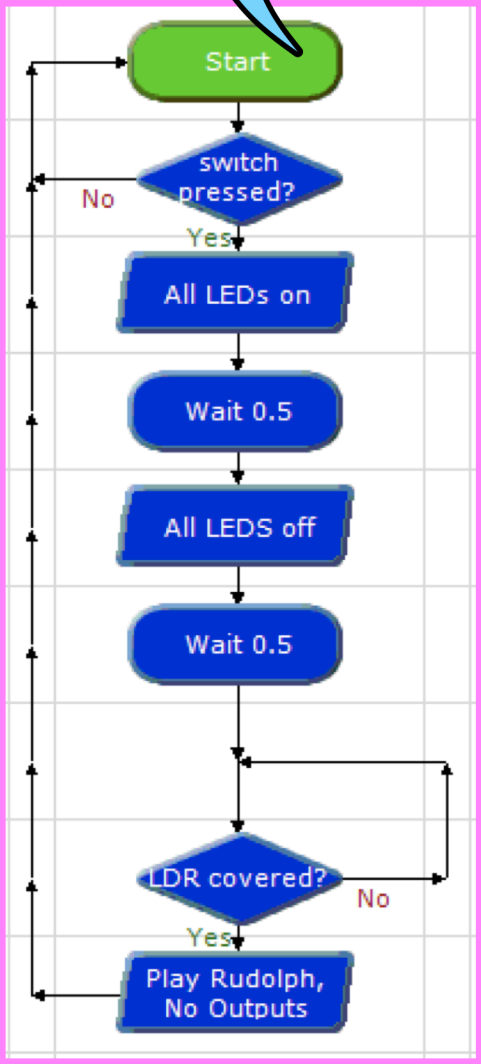
DOWNLOAD A PROGRAM TO TEST THE LDR; E.G. TURN ALL LEDS ON IN THE DARK AND OFF IN THE LIGHT.



FINISHING OFF...

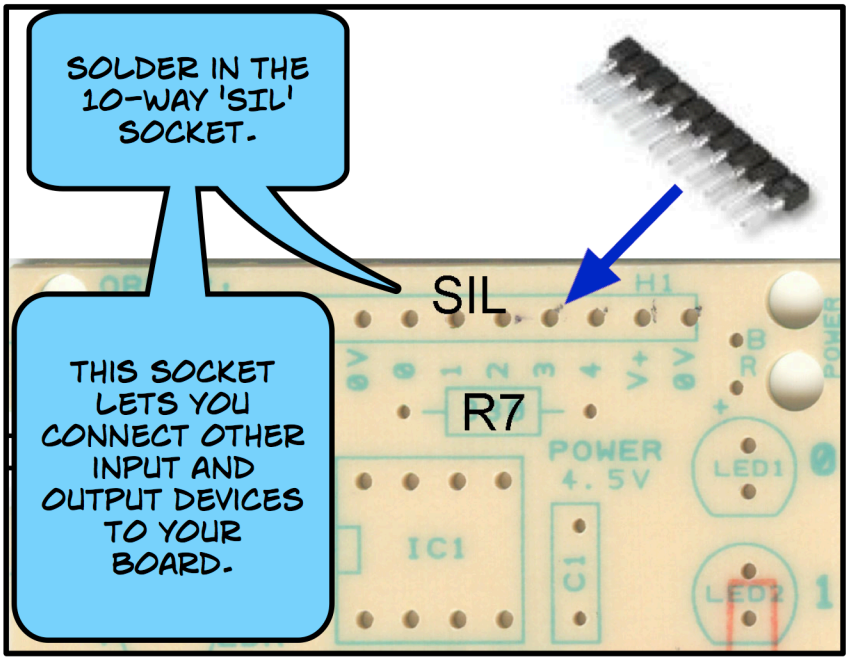
TEST POINT 9

DOWNLOAD A PROGRAM TO TEST THE WHOLE BOARD.



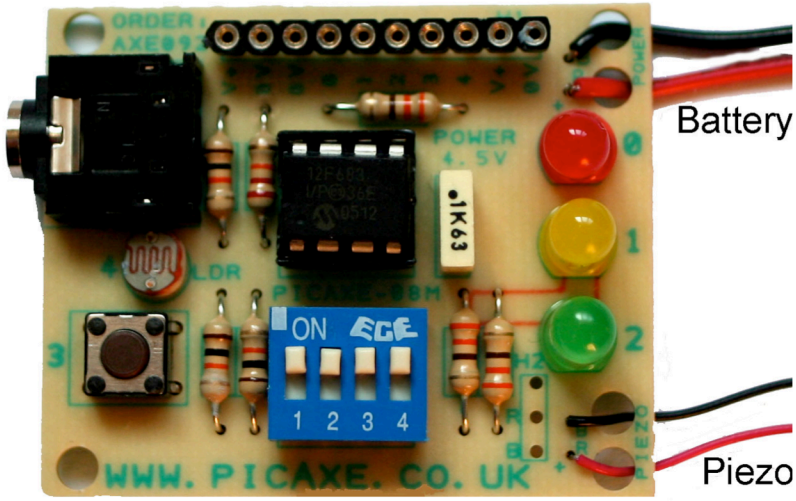
SOLDER IN THE 10-WAY 'SIL' SOCKET.

THIS SOCKET LETS YOU CONNECT OTHER INPUT AND OUTPUT DEVICES TO YOUR BOARD.



DON'T GO ANY FURTHER UNTIL THE FINAL TEST HAS BEEN PASSED

THE BOARD IS NOW COMPLETE



TIME TO LEARN MORE ABOUT PROGRAMMING IT TO DO WHAT YOU WANT IT TO DO...

FAIR USE OF THIS MATERIAL

THIS COMIC HAS BEEN PRODUCED BY TORBEN STEEG. TORBEN@STEEG.CO.UK