

Successes were:



MY MARKS OUT OF 100  
ARE:

Even better if:



**CORE - A**

Energy,  
materials,  
systems,  
devices /20

**CORE - A**

Materials  
& their  
working  
properties /20

**MAKING - C**

Material  
management  
&  
Production

**DESIGN - C**

Design/  
drawing  
techniques /20

**DESIGN - C**

Designing &  
Making  
principles /20



GCSE Grade boundaries from last year	9	8	7	6	5	4	3	2	1
Exam score	79	71	63	56	49	42	31	20	10

## Section C: Design & making principles

DESIGNING PRINCIPLES			
	R	A	G
Design brief & specification			
Design Strategies			
Communication of Design ideas and prototype Development			

Do a **mind map** to help you answer the question.

**Suitability  
of product  
for the user**

TOP TIPS TO MAX YOUR MARKS!	MARK
LINK THIS PRODUCT TO THE USER. WHY IS IT SUITABLE? <u>HOW IS IT RELEVANT</u> TO THEM?	1
WHAT ARE THE <u>POSITIVES</u> ABOUT THIS PRODUCT – IN RELATION TO THE USER?	1
WHAT ARE THE <u>NEGATIVES</u> ABOUT THIS PRODUCT - IN RELATION TO THE USER?	1
YOUR <u>OVERALL CONCLUSION</u> ABOUT SUITABILITY FOR USER - <u>GIVE REASONS WHY</u> (PEE)	1

*Study the picture in Figure 1 and the specification below.*



Figure 1.

## Specification for playground equipment

- For use by children age 4-12
- Designed for external use
- Recessed/flush fitting construction fittings used
- All fittings are tamper proof
- Use of weatherproof materials
- Suitable for installation on a flat surface
- Use of non-slip surfaces
- Tough, durable and wear resistant finish applied to all parts
- Parts designed to be bolted together

**Q1. Analyse and evaluate the playground equipment in terms of suitability for the user (4 marks)**

[illegible]

PEER FEEDBACK				
TEACHER ASSESSMENT	CORRECT MISTAKES	ADD DETAIL & INFORMATION	ENSURE WORK IS COMPLETE	NO ACTION REQUIRED
TEACHER COMMENT				

## Section C: Design & making principles

*Q2. Analyse and evaluate the playground equipment in terms of its aesthetic quality (4 marks)*

---

---

---

---

---

---

---

---

*Q3. Analyse and evaluate the playground equipment in terms of its ergonomics (4 marks)*

---

---

---

---

---

---

---

---

*Q4. Explain what is meant by the term 'anthropometrics' and why it is important for designers to consider. (4 marks)*

---

---

---

---

---

---

---

---

*Q5. Name two anthropometric measures that might be used in the design of playground equipment. Explain why each is appropriate. (4 marks)*

---

---

---

---

---

---

---

---

PEER FEEDBACK	
------------------	--

TEACHER ASSESSMENT	CORRECT MISTAKES	ADD DETAIL & INFORMATION	ENSURE WORK IS COMPLETE	NO ACTION REQUIRED
TEACHER COMMENT				

## Section C: Design & making principles

### DESIGNING PRINCIPLES

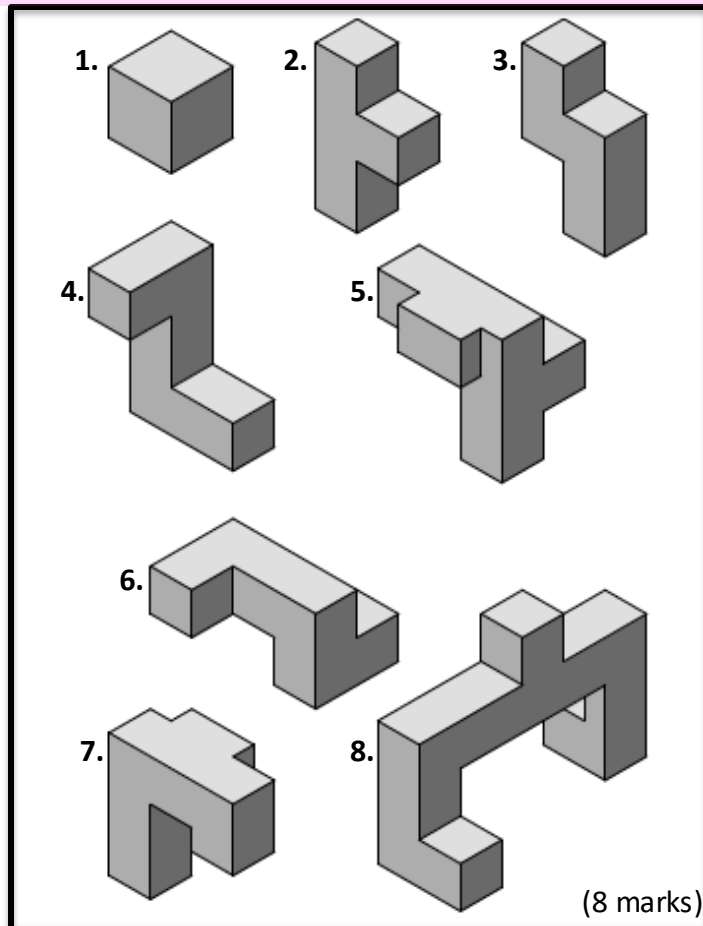
Communication of Design ideas, drawing techniques.

R

A

G

1. – 8. Produce the eight isometric drawings below on the grid to the right.



(8 marks)

9. Isometric drawings are produced in what angle? \_\_\_\_\_ (1 mark)

10. Give one advantage of drawing in isometric. \_\_\_\_\_ (1 mark)

### TOP TIPS TO MAX YOUR MARKS!

USE A SHARP PENCIL. DRAW LIGHTLY AT FIRST. GO OVER IT AGAIN WHEN IT IS CORRECT.

MARKS

10

### PEER FEEDBACK

TEACHER  
ASSESSMENT

CORRECT  
MISTAKES

ADD DETAIL &  
INFORMATION

ENSURE WORK IS  
COMPLETE

NO ACTION  
REQUIRED

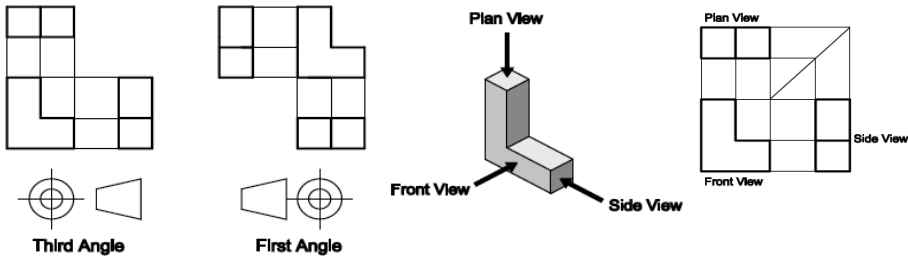
TEACHER  
COMMENT

/10

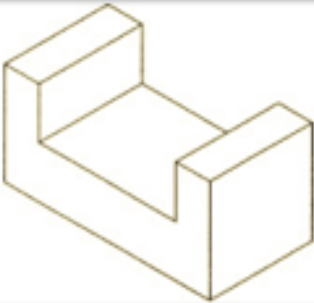
Section C: Design & making principles

DESIGNING PRINCIPLES

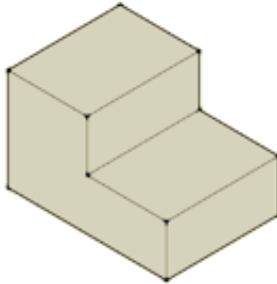
Communication of Design ideas, drawing techniques.



11.



12.

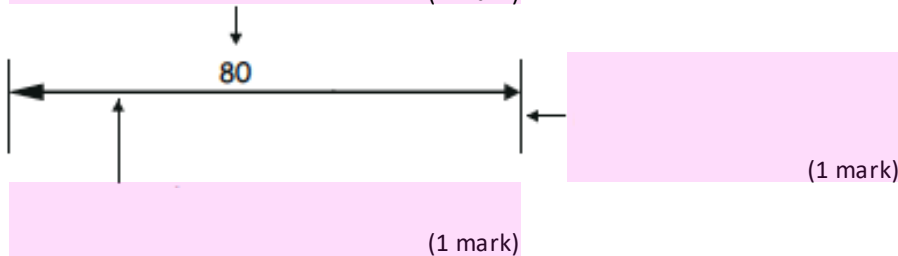


13. Identify one factor that make orthographic drawings an appropriate format to enable manufacturing to take place?

(1 mark)

14. Label all three orthographic drawing conventions below.

(1 mark)



(1 mark)

(1 mark)

TOP TIPS TO MAX YOUR MARKS!

MARKS

USE A SHARP PENCIL. DRAW LIGHTLY AT FIRST. GO OVER IT AGAIN WHEN IT IS CORRECT.

10

11.

12.

(3 marks)

(3 marks)

PEER  
FEEDBACK

TEACHER  
FEEDBACK

## Section C: Design & making principles

### MAKING PRINCIPLES

#### Material Management & Marking Out

1. What is a benefit of reducing the amount of waste when manufacturing a product? Chose an answer from the options below. (1 mark)

Colourful products

Faster manufacturing

Higher prices

Reduction in costs

2. Explain the reason for your answer to question 1.

(1 mark)

3. When batch or mass producing a product, identical shapes are often cut from sheets of material. Demonstrate tessellation of the shape in the box.

(1 mark)



4. Nesting can also help to reduce waste. Show how you would use nesting layouts with the shape in the box. (1 mark)

4. What is a scribe?

(1 mark)

### TOP TIPS TO MAX YOUR MARKS!

FIND OUT THE DIFFERENCE BETWEEN TESSELLATION AND NESTING.

2

USE THE MARKS SCHEME AND EXAM TIPS EFFECTIVELY.

3

USE YOUR D&T REVISION GUIDE TO RESEARCH KEYWORDS AND MEANINGS.

5

## Section A: Core technical principles

### NEW AND EMERGING TECHNOLOGIES

#### Production techniques & systems

#### Informing design decisions

5. Explain why designers create models of their designs before final manufacture.

(3 marks)

#### MARKS SCHEME AND EXAM TIPS – USE THIS INFORMATION TO CONSTRUCT YOUR ANSWER.

3 marks	Thorough explanation of why designers create models, excellent understanding of the purpose of models.	<b>Model answers will include:</b> <ul style="list-style-type: none"> <li>Identifying issues before production saving time and cost.</li> <li>Quicker speed of manufacture</li> <li>Allowing the potential target market to look and give feedback.</li> <li>Having a product you can hold and test, such as size, function, fitting etc.</li> </ul>
2 marks	Some explanation of why designers create models, showing good understanding of their purpose.	
1 mark	Limited explanation of why designers create models, showing basic understanding of their purpose.	
0	Nothing worthy of credit.	

6. What is meant by the term planned obsolescence?

(1 mark)

7. What is Just In Time manufacturing, (JIT) ?

(1 mark)

PEER FEEDBACK				
TEACHER ASSESSMENT	CORRECT MISTAKES	ADD DETAIL & INFORMATION	ENSURE WORK IS COMPLETE	NO ACTION REQUIRED
TEACHER COMMENT				

/10

## Section A: Core technical principles

### ENERGY, MATERIALS, SYSTEMS, DEVICES

	R	A	G
Energy Generation & Storage			
Smart Materials			
Systems approach to Designing			
Mechanical Devices			

1. Explain the difference between renewable and non-renewable energy sources.

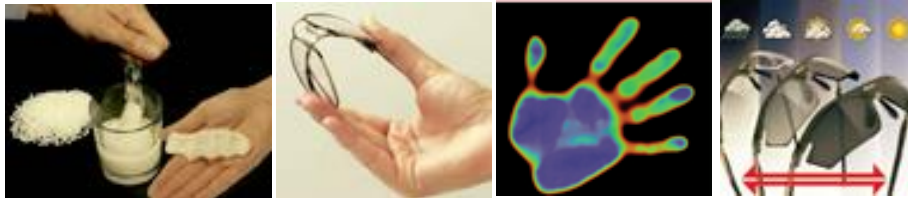
(1 mark)

2. What is the benefit of using rechargeable batteries rather than traditional alkaline batteries.

(1 mark)

3. How is a smart material different to other materials?

(1 mark)



### TOP TIPS TO MAX YOUR MARKS!

USE YOUR D&T REVISION GUIDE TO HELP YOU ANSWER THESE QUESTIONS.

MARKS

10

### Key word

### Definition:













#### 4. Electronic System

(1 mark)

#### 5. The three elements of a manufacturing system are called:

I \_\_\_\_\_ → P \_\_\_\_\_ → O \_\_\_\_\_ (1 mark)

6. Find the INPUT, PROCESS and OUTPUT that go together. Identify the matches by numbering them the same number. (4 marks)

①  Bread	 Blending	 Ice
②  Orange	 Freezing	 Pizza
③  Dough	 Toasting	 Orange Juice
④  Water	 Baking	 Toast

7. Integrated circuits (IC's) are tiny, self contained circuits. They can contain billions of components. Give two benefits of using IC's in an electronic system rather than lots of separate components. (1 mark)

### PEER FEEDBACK

TEACHER  
ASSESSMENT

CORRECT  
MISTAKES

ADD DETAIL &  
INFORMATION

ENSURE WORK IS  
COMPLETE

NO ACTION  
REQUIRED

TEACHER  
COMMENT

/10



## Section A: Core technical principles

### MATERIALS & WORKING PROPERTIES

	R	A	G
Natural and manufactured Timbers			

Use the bubbles below to explain the properties of Hardwoods and Softwoods.

### Hardwood

### Softwood

1. Complete the table, give a name and application/product type for each wood.

	Name:	Typical application:
Hardwood		
Softwood		
Manufactured board		

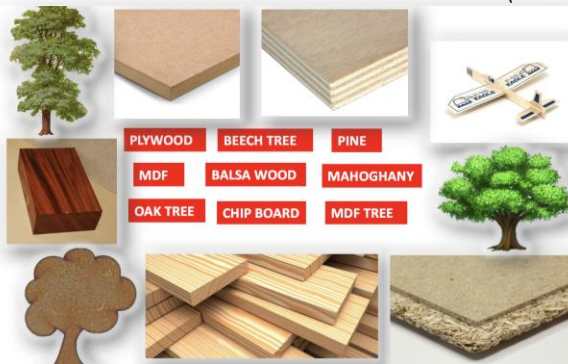
(3 Marks)

Match the types of Woods and Trees.

2. Which doesn't seem quite right? (1 Mark)

3. Why?

(1 Mark)



### MATERIALS & WORKING PROPERTIES

	R	A	G
Polymers			

4. Complete the table, give a name and application/product type for each polymer.

	Name:	Typical application:
Thermosetting polymer		
Thermoplastic polymer		

(2 Marks)

Match the types of plastics.



5. Give two properties of urea formaldehyde that make it an appropriate choice of material for an electrical light switch.

(1 Mark)

(1 Mark)

6. Name this process used to form plastic in this image.

(1 Mark)



### PEER FEEDBACK

TEACHER ASSESSMENT	CORRECT MISTAKES	ADD DETAIL & INFORMATION	ENSURE WORK IS COMPLETE	NO ACTION REQUIRED
TEACHER COMMENT				

/10

### TOP TIPS TO MAX YOUR MARKS!

### MARKS

REMEMBER WHICH WOODS YOU HAVE WORKED WITH / TESTED IN THE WORKSHOP.

10



## Section A: Core technical principles

### MATERIALS & WORKING PROPERTIES

	R	A	G
Metals and Alloys			

1. Match the types of metals to the items.

2. What is a Ferrous metal? (1 Mark)

3. What is a non-ferrous metal? (1 Mark)

4. What is an Alloy? (1 Mark)



Metals & alloys	Typical application:
Cast Iron	
High carbon steel	
Aluminium	
Copper	
Brass	
Stainless steel	

5. Explain what rust and oxidization is?

(2 Marks)

6. How is iron mined and from what raw material?

1 Mark)

### TOP TIPS TO MAX YOUR MARKS!

USE A SHARP PENCIL. DRAW LIGHTLY AT FIRST. GO OVER IT AGAIN WHEN IT IS CORRECT.

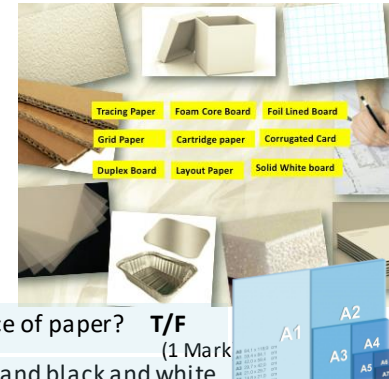
MARKS

10

### MATERIALS & WORKING PROPERTIES

	R	A	G
Papers and Boards			
Textiles			

Papers & boards	Typical application:
Corrugated card	
Duplex board	
Foil lined board	
Foam core board	
Ink jet card	
Solid white board	



1. An A4 sheet of paper is bigger than an A9 piece of paper? T/F

(1 Mark)

2. School flyers are often printed in low quality and black and white.

Give two reasons why this is?

(2 Marks)



Textiles	Typical application:
Natural fibres	
Synthetic fibres	
Blended & mixed fibres	
Woven fabric	
Non-woven fabric	
Knitted textiles	

3. In knitting, what is the difference between a weft and warp knit?



(1 Mark)

PEER FEEDBACK				
TEACHER ASSESSMENT	CORRECT MISTAKES	ADD DETAIL & INFORMATION	ENSURE WORK IS COMPLETE	NO ACTION REQUIRED
TEACHER COMMENT				

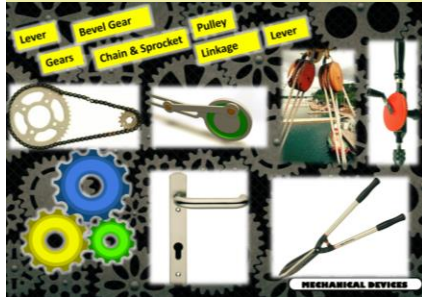
/10

## Section A: Core technical principles

### ENERGY, MATERIALS, SYSTEMS, DEVICES

#### Mechanical Devices - Levers

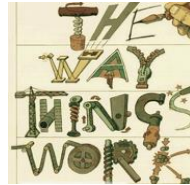
Match the types of metals to the items.



#### What is a mechanism?

The technological advances humans have made through the ages, have been closely linked with their ability to harness energy and use it to perform mechanical work.

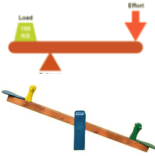
Although humans are very clever creatures, our size, structure and muscles put severe limitations on what we can do. – MECHANISMS HELP!



#### Three types of lever

##### First order

- Class 1 lever



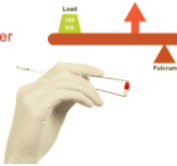
##### Second order

- Class 2 lever



##### Third order

- Class 3 lever



1. Give two examples of a first order lever.

2. Give two examples of a second order lever.

3. Give two examples of a third order lever.

(6 Marks)

**Levers** are a simple type of machine. They change the amount of **effort** or force needed to move a load.

They consist of a rigid bar or beam that pivots around a fixed point called a **fulcrum**.

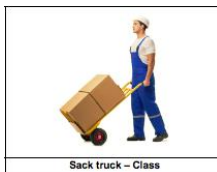
*This task is about different orders of levers:*

4. For each of the four pictures below, show where the effort, load and fulcrum are positioned. Add the letters **E** for effort, **L** for load and **F** for fulcrum, and add the class of lever next to its name.

(4 Marks)



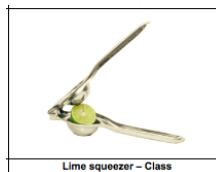
Scissors – Class



Sack truck – Class



Tweezers – Class



Lime squeezer – Class

### COMMON TECHNICAL PRINCIPLES

#### Forces & stresses on material objects

##### Tension



##### Compression



##### Bending



##### Shear



##### Torsion



The working properties of a material are those that involve how the materials react to some form of applied force. Strength is the ability of a material to withstand a force or load that is applied to it.

5. Complete the description of each force in the table below.

(10 Marks)

Force	Description	How a material/object can be adapted to resist
Tension		Concrete can have steel bars inserted to reinforce
Compression		Composite panels can have a honeycomb structure sandwiched in the middle to resist
Bending		Steel beams have an I profile to resist bending
Shear		Bolts are hardened and have unthreaded shanks to help stop shearing
Torsion		The diagonals on a tower crane help the structure against torsion

#### PEER FEEDBACK

TEACHER ASSESSMENT

CORRECT MISTAKES

ADD DETAIL & INFORMATION

ENSURE WORK IS COMPLETE

NO ACTION REQUIRED

TEACHER COMMENT

/10