Year 13

A Level Product Design Exam Preparation

Exam Board: Pearson Edexcel

Specification: 9DT0

A Level Design and Technology (Product Design) (9DT0) Specification Issue 2

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Year 13 Product Design Revision

Half Term 1

During year 13, you will cover the remaining 1/3 of the content.
If you **RED** or **AMBER** sections, make a note of the specific bits which you are struggling with.

Topics	Key Concepts	R	A	G
7.1 Safe working practices and risk assessments	*Adopting safe working practices, recognise and react to potential hazards:* a) understanding safe working practices for yourself and others when designing and making b) understanding the need for risk assessments – identification of potential hazards, identification of people at risk, evaluation of risks, implement control measures, recording and storing of risk assessment documentation			
8.1 Quantity production	*Characteristics and stages of the following methods of production when applied to products and materials:* a) one-off production b) batch production c) high-volume production			
8.2 Quality Control	*Characteristics, application, advantages and disadvantages of the following types of quality monitoring systems:* a) quality control b) quality assurance c) Total Quality Management (TQM) – including reference to ISO 9000			
8.3 Modern manufacturing methods	*Characteristics, processes, application, advantages and disadvantages and the importance of considering accuracy of production and efficiency of modern manufacturing methods and systems when designing for manufacture for small, medium and large scale production:* a) production scheduling and logistics b) robotics in production c) materials handling systems – ASRS and AGVs d) flexible manufacturing systems (FMS) e) lean manufacturing using just-in-time (JIT) f) standardised parts, bought-in components g) quick response manufacturing (QRM) h) product data management (PDM) and enterprise resource planning (ERP) systems i) concurrent manufacturing			
9.1 Life Cycle Analysis	*Characteristics, application, advantages and disadvantages of 'cleaner' design and technology – a product's life cycle in relation to the following sustainable development issues:* a) material selection b) manufacture c) distribution d) use e) repair and maintenance f) end of life			

Revision Questions:

7.1 Safe working practices and risk assessments

1. Whose responsibility is it to follow H&S rules?
2. What do the letters HSE stand for?
3. What are the 5 stages to a risk assessment?
4. Complete a risk assessment for using the belt sander.
5. Why is it important to have a risk assessment in place for all tools and machinery?

8.1 Quantity production

1. What are the advantages and disadvantages of one-off production?
2. What are the advantages and disadvantages of mass production?
3. What are the advantages and disadvantages of continuous production?
4. What are the advantages and disadvantages of batch production?
5. What manufacturing are used in batch production to improve efficiency and accuracy? Explain how each one is used.

8.2 Quality control

1. What do the letters QA stand for and what does it mean?
2. What is meany by quality control?
3. What are the 3 different levels of testing and when are they used?
4. What is the difference between destructive and non-destructive testing?
5. What do the letters TQM stand for and what is it?
6. What is the ISO 9000? What does it represent?

8.3 Modern manufacturing methods

1. What is production scheduling and why is it so important?
2. What is automation and how does this link to modern manufacturing?
3. What are the advantages and disadvantages of automation? Name at least 4 of each.
4. Name the 2 types of material handling systems and the difference between the 2.
5. What does FMS stand for and what is it?
6. What are manufacturing cells? What are the advantages of using them?
7. Name at least 4 advantages of using JIT production and at least 2 disadvantages.
8. What is lean manufacturing and what are the 5 main stages to it?
9. What is the difference between Kaizen and Kanban?
10. What does QRM stand for and what is it?
11. Name at least 3 advantages and 3 disadvantages of QRM.
12. What does PDM stand for and what is it?
13. What does ERP stand for and what is it?
14. Name at least 4 disadvantages to ERP.
15. What is the difference between concurrent manufacturing and sequential manufacturing?
16. Name at least 4 advantages to using concurrent manufacturing.
17. What do the letters QFD stand for and what is it?
18. Why would a company use standard components or bought in components?

9.1 Life Cycle Analysis

1. What is the difference between ‘cradle to grave’ and ‘cradle to cradle’?
2. Name the 6 different parts to an LCA and key points to each.

Half Term 2

If you **RED** or **AMBER** sections, make a note of the specific bits which you are struggling with.

Topics	Key Concepts	R	A	G
9.2 Greener design and cleaner technologies	*The wider issues of using cleaner technologies:* a) cost implications to the consumer and manufacturer b) sustainability – designing without jeopardising the potential for people in the future to meet their needs			
10.1 Consumer Rights legislation	*From the consumer's point of view the implications of consumer rights legislation to consumers and manufacturers:* a) Consumer Rights Act (2015) b) Sale of Goods Act (1979)			
10.2 Health and Safety laws	*The principles and applications of health and safety laws and regulations, including the consequences of non-adherence:* a) Health and Safety Executive b) Health and Safety at Work etc Act (1974) – procedures, personal protective equipment (PPE), signage, warning symbols c) Control of Substances Hazardous to Health (COSHH) regulations – the storage and use of them			
11.1 Collection, collation and analysis of information	*Collection, collation and analysis of information and the use of this to make informed decisions:* a) marketing analysis and research techniques b) innovation management c) feasibility studies on proposed solutions			
11.2 Budgeting projects	*Modelling the costing of projects to achieve an optimum outcome:* a) budgets – undertaking financial forecasts b) planning – allocation of: o employees o materials o scale of production c) selection of appropriate tools, machines and manufacturing processes			

Revision Questions:

9.2 Greener and cleaner design

1. What are the main drawbacks to using cleaner/greener technologies for manufacturing? (for the manufacturers)
2. Why is it important for sustainability to be considered when designers are producing ideas and concepts?

10.1 Consumer Rights legislation

1. Explain the purpose of the Consumer Rights Act (2015).
2. Explain the purpose of the Sales of Goods Act (1979).
3. What is the difference between the 2? Why was it changed?

10.2 Health and Safety laws

1. Explain the Health and Safety at Work Act (1974).
2. What does PPE stand for?
3. List all PPE used to protect the hands and arms.
4. List all PPE used to protect the lungs.
5. List all PPE used to protect the head.
6. List all PPE used to protect the eyes.
7. List all PPE used to protect the feet and head.
8. List all PPE used to protect the whole body.
9. List the 5 different types of signage that is used, describe how they look and what they represent.
10. What does COSHH stand for and what does it refer to?

11.1 Collection, collation and analysis of information

1. What us market analysis and what does it entail?
2. Why are interviews used as part of market research?
3. What is desktop research?
4. What is innovation management?
5. What are feasibility studies and why are they so important?

11.2 Budgeting projects

1. What is a financial forecast and why is it important?
2. What factors are considered in a financial forecast?
3. What happens if a product recall takes place?

Half Term 3

If you **RED** or **AMBER** sections, make a note of the specific bits which you are struggling with.

Topics	Key Concepts	R	A	G
11.3 Intellectual Property	*The importance, implications and ways of protecting the intellectual property rights of designers, inventors and companies:* a) patents b) copyrights c) design rights d) trademarks			
11.4 Standards	*Implication to designers, manufacturers and consumers of the following standards when developing designs and manufacturing products:* a) British Standards (BSI and kite mark) b) European (CEN and CE) c) International Standards (ISO)			
12.1 Strategies to create designs	*Strategies, techniques and approaches to explore, create and evaluate design ideas:* a) user-centred design b) circular economy – biologically based systems and an understanding of how waste and pollution can be eliminated c) systems thinking – the influence of systems on commercial activity to enable all elements of a manufacturing enterprise to work together			
12.2 Project Management systems	*Applications, characteristics, advantages and disadvantages of the following project management strategies:* a) critical path analysis – the handling of complex and time sensitive operations b) scrum – how flexible, holistic product development is achieved c) Six Sigma – the improvement of output quality of a process by identifying and removing the causes of defects and setting value targets			
12.3 Product Life Cycle	*The cost, sales, profit and market implications to the designer and manufacturer of the stages of a product's life cycle:* o Introduction Stage o Growth Stage o Maturity Stage o Decline Stage			

Revision Questions:

11.3 Intellectual Property

1. What is meant by an Intellectual Property?
2. Name the 4 different types of IP.
3. For each IP, state what it protects and how long it is protected for.
4. What happens if an IP is copied without permission?

11.4 Standards

1. What do the letters BSI stand for and what is it?
2. What is the kite mark?
3. What does the CE mark represent?
4. What do the letters ISO stand for and what is it?
5. What is the ISO 9000?

12.1 Strategies to create designs

1. Explain what is meant by user centred design, in as much detail as possible.
2. What is meant by circular economy?
3. What is systems thinking and who tends to use it?
4. What is the purpose of systems thinking?

12.2 Project Management systems

1. Explain critical path analysis.
2. Explain what scrum is.
3. What is six sigma?
4. What are the different stages to six sigma? Explain each one.
5. What are the advantages of using six sigma?

12.3 Product Life Cycle

1. Briefly explain, what is a Product Life Cycle?
2. For each stage of Product Life Cycle, explain what happens.

Half Term 4

You will complete some revision lessons; these will be based upon weaknesses.

Half Term 5

You have will have a separate revision itinerary for half term 5.