



*Junior Certificate Examination, 2020*

## ***Technology***

### ***Design Tasks***

*Ordinary Level - 240 marks*

*Higher Level - 200 marks*

*The design briefs for the Junior Certificate Examination 2020 are given overleaf.*

***The Design Task must be available for assessment by Friday 24 April 2020.***

## **Instructions to candidates:**

1. Design and make any **one** of the design tasks listed opposite.
2. The design task submitted for assessment must consist of two components: a design folder **and** an artefact.
3. If **either** assessment component (written examination or coursework) is submitted at Ordinary Level, the subject is graded at Ordinary Level.
4. All work submitted for assessment must be clearly identified with your examination number.
5. Tasks submitted for assessment must be the candidates **own individual work**.
6. The design task must be completed **in school** under the supervision of the class teacher.
7. When using research sources, including the Internet, the sources must be acknowledged. Research material copied directly from the Internet or from other sources and presented as your own work will not receive any marks.
8. Shading and colour should be used where appropriate in your design folder.
9. Coursework which does not demonstrate a range of manual processing skills and appropriate assembly techniques as outlined in the syllabus will lose marks.
10. Coursework where specialist processes (e.g. CAD CAM) are used, but are not supported in the design folder by the inclusion of drawings and/or descriptions as appropriate will lose marks.
11. If microprocessors are used in the electronic sub-system a diagram showing the relevant Inputs and Outputs as well as the flowsheet/program should be included in your design folder.
12. All important operating features must be easily accessible.
13. Presentation and finished appearance of both folder and artefact are important.

***The Design Task must be available for assessment by Friday 24 April 2020.***

## **Storage of design tasks:**

On completion of the design task, school authorities should ensure that the finished artefact and design folder are kept in a safe place under lock and key until the examining process (including appeals) has concluded.

## **Allocation of marks:**

### **Design Tasks**

240 marks are allocated for design tasks at Ordinary Level.

200 marks are allocated for design tasks at Higher Level.

### **The Design Folder**

Forty percent (40%) of the marks are allocated for the design folder.

### **The Artefact**

Sixty percent (60%) of the marks are allocated for the artefact.

# Technology Design Tasks 2020

Complete **any one** of the following tasks using a range of materials and manufacturing processes:

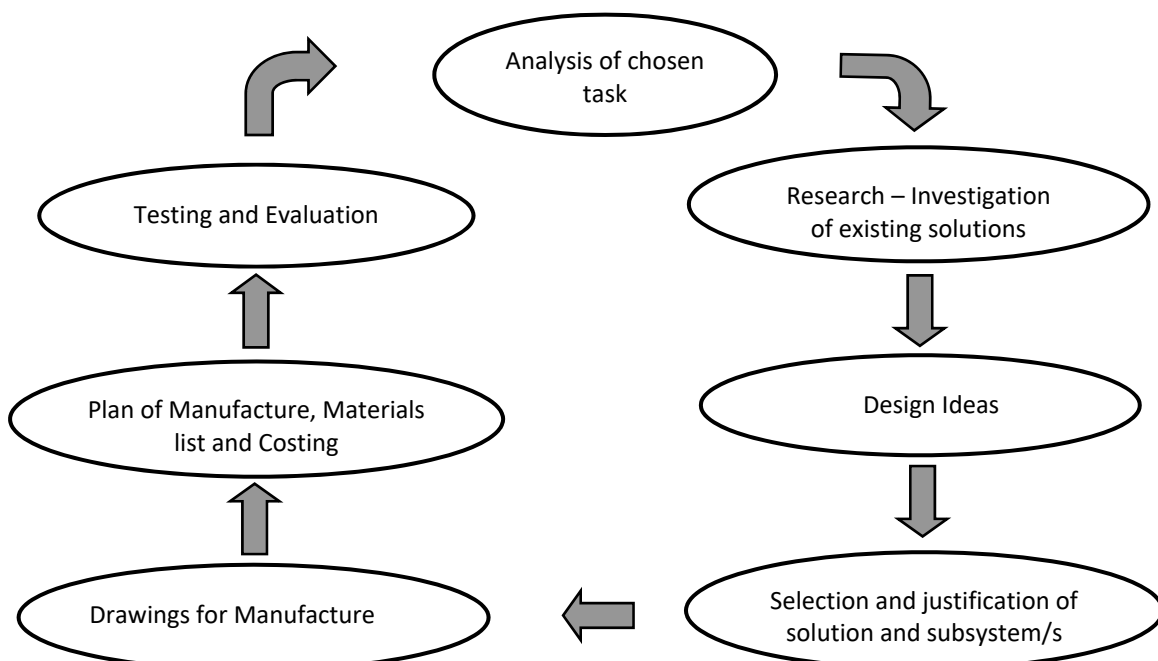
- A. Design and make a working model of an **electronically controlled automatic irrigation system** for a row of plants in a greenhouse.
- B. Design and make a **portable electro-mechanical device** for the even dispersal of lawn seed. The device should incorporate variable speed control.
- C. Design and make an **electro-mechanical random number generator** for your local sports club lotto (or for an application of your choice).
- D. Height adjustable devices play an important role in improving access to buildings or other amenities for people with reduced mobility. With this in mind, design and make a working model of an **electro-mechanically controlled height adjustable device**. Your solution must include limit switching to control the device at its fully raised and fully lowered positions.
- E. Design and make a working model of a **propeller driven terrestrial vehicle with directional control**. **Note:** Remote control is not a requirement.
- F. Design and make a working model of an **electro-mechanical conveyor belt** for transporting parcels. The conveyor belt must stop automatically when a parcel it is transporting is detected as being too tall.

## NOTE:

- Power sources should be provided where necessary and must not exceed 12V DC.
- Where appropriate, operating features such as switches should be clearly labelled.

## Information for examination candidates:

A simple model of a design process is shown below. It is recommended that you follow the logical sequence of this design process and that evidence of each stage is reflected in your design folder.



## Marking Scheme

The table below gives an outline of the marking headings used to assess your task. While the same headings apply at both levels, the marking criteria at Higher Level demand greater detail and precision in both the design folder and the artefact. While the general headings and marks will largely remain the same, assumptions about future marking schemes on the basis of past schemes should be avoided.

Ordinary and Higher Level marking schemes are available on [www.examinations.ie](http://www.examinations.ie)

It is recommended that evidence of each stage is reflected in your design folder.

<b>Folder</b>		
<b>Analysis of brief</b>	Analysis should incorporate the following features: Breakdown of the brief and design specification/list of objectives specific to the task.	<b>5</b>
<b>Investigation of possible solutions</b>	Evidence of investigation: (sketches, photos, descriptions, etc.) Relevant research on the task itself and its mechanical/electronic systems.	<b>5</b>
<b>Design Ideas</b>	One Design Idea presented in 3D format (Ordinary level). Two Design Ideas presented in 3D format ((Higher level).	<b>6</b>
<b>Criteria for selection of solution</b>	Valid justification of your selected idea and the sub-system/s.	<b>4</b>
<b>Sketches /drawings for manufacture</b>	Working drawings of the chosen solution and circuit drawing/s (flow-sheet where applicable).	<b>6</b>
<b>Manufacturing sequence/processes</b>	Sequence of events for the manufacture of the chosen solution. Materials List with sizes and costs.	<b>6</b>
<b>Testing and Evaluation</b>	Evidence of testing/modification during manufacture and evaluation against the brief/design specification and/or third party evaluation.	<b>4</b>
<b>Presentation of folder</b>	Layout: use of diagrams, sketches, photographs, neat and orderly.	<b>4</b>
<b>Artefact</b>		
<b>Artefact satisfies brief</b>	Does the artefact produced by the candidate satisfy the brief?	<b>5</b>
<b>Suitability, Functionality</b>	Do all the necessary elements of the artefact function?	<b>5</b>
<b>Design/Inventiveness</b>	Inventive design of the artefact and sub-system?	<b>5</b>
<b>Originality, commercial comp.</b>	Creative use of materials/recycled parts/electro-mechanical components/mechanisms/colour/shape. Acceptable use of commercial components?	<b>5</b>
<b>Appropriateness of materials</b>	Materials selected suited to their respective functions?	<b>6</b>
<b>Appropriate sub-system(s)</b>	Appropriate electro-mechanical/electronic sub-system?	<b>6</b>
<b>App. manufacturing processes</b>	Complete artefact and sub-system manufactured using appropriate processes?	<b>6</b>
<b>Quality of processes</b>	Quality of the artefact after manufacture?	<b>6</b>
<b>Assembly</b>	Appropriate methods of assembly used? Quality of assembly.	<b>4</b>
<b>Detailed finish/Safety Considerations</b>	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	<b>4</b>
<b>Tech. competencies/ Application of skills</b>	Appropriate level and range of skills/technological competencies?	<b>4</b>
<b>Overall presentation</b>	Attractive, well presented artefact?	<b>4</b>