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| Technology Progression Ladder | | | | | | | | | | |
| **Advice note** - When deciding where to place students on the ladder a holistic approach may be needed since it is unlikely all areas will be met to the same standard. | | | | | | | | | | |
|  | DESIGN & DEVELOPMENT | MAKING SKILLS  (practical outcomes) | SPECIFICATION & PLAN FOR MANUFACTURE | Needs checking 13/11/19 EVALUATION, TESTING & MODIFICATION | TECHNICAL KNOWLEDGE (TK) | 7 | 8 | 9 | 10 | 11 |
| <1 | No designs of their own generated. May work from an existing idea or be given a focussed practical task. | - Incomplete outcome  - Very low level of skills and understanding.  - Needs to be shown each stage  - The need for safety in the workshop is understood. | Not focussed on at this level.  This may not be present in their work. | - Basic evaluation (may be on preformatted sheets) completed with assistance at end of project.  - Rudimentary on-going evaluation and modifications can be communicated (verbally or written)  - Some peer assessment (verbal or written) | Very little prior technical knowledge evident. | 101 |  |  |  |  |
| 1 | Identify and understand user needs. Create a single design idea, little or no rendering and annotation.  May be given a focussed practical task. | - Basic outcome, largely complete.  - Basic level of skill shown / required to complete.  - Can repeat a technique with some guidance.  - The need for safety in the workshop is understood and always implemented. | - Basic design specification (most points given to student).  - Little or no written planning expected. | - Evaluation of an existing product (using prompts) completed to a basic level.  - Evaluation (may be on preformatted sheets) completed with some assistance at end of project.  - On-going evaluation and modifications can be communicated (verbally or written)  - Peer assessments contain www and ebi | Students have basic understanding of some areas of KS2 technical knowledge.  *(See relevant National Curriculum document for details.)* | 102 | 101 |  |  |  |
| 2 | Generate ideas by collecting and using information. Most ideas will be for the use by the designer. More than one design idea generated, limited rendering and annotation. | - Complete outcome made to a reasonable quality.  - Entry level skills shown / needed to complete.  - Working with some independence.  - Choosing correct tools.  - The need for safety in the workshop is understood and always implemented in their work without the need to be reminded. | - Basic design specification, some of which generated by student.  - Manufacturing plan contains some relevant stages, may be verbal or written evidence. | - Evaluation of an existing product showing knowledge materials, needs of user etc. completed  - Evaluation (may be on preformatted sheets) completed at end of project should clearly show areas of strength and areas for improvement.  - On-going evaluation and modifications can be communicated (verbally or written) and acted upon.  - Peer assessments contain meaningful www and ebi comments. | Students have a good understanding of most of the main areas of KS2 *(See relevant National Curriculum document for details.)* technical knowledge. They begin to use and apply this knowledge with some guidance. | 103 | 102 | 101 |  |  |
| 3 | Produce ideas that meet basic briefs /specifications /needs of customer. Generate a range (3 or more) of design ideas, some annotation added that complements their designs. Design ideas are communicated sufficiently for a third party to understand. | - Outcome requires skill to complete.  - Good quality make.  - Reasonable accuracy.  - Select appropriate tools and materials.  - Independent work with only guidance input.  - Safe practice in the workshop is understood and always implemented in their work without the need to be reminded. | - Basic design specification, some of which generated by student.  - Manufacturing plan contains some relevant stages, may be verbal or written evidence.  - Some tools techniques and processes identified. | - Evaluation of an existing product showing knowledge materials, needs of user etc. completed  - Evaluation (may be on preformatted sheets) completed at end of project should clearly show areas of strength and specific areas for improvement.  - On-going evaluation and modifications can be communicated (verbally or written) and are acted upon with increasing independence.  - Peer assessments made contain meaningful www and ebi comments. | - Students are clearly building on a thorough understanding of KS2 *(See relevant National Curriculum document for details.)* knowledge.  - They can use and apply some this knowledge independently. This may be verbally, practically or in written work.  - New knowledge covered at early KS3 is being implemented in their own independent work. | 104 | 103 | 102 | 101 |  |
| 4 | Some ideas are creative. Communication is reasonably clear.  Ideas are presented using techniques which may include sketching, perspective, crating and CAD.  Different design strategies considered.  The designer has taken into account design criteria and ongoing research.  Some design may be evident.. | - Outcome requires a variety of skills to complete.  - Good quality make.  - Reasonable accuracy.  - Made on time.  - Can Select a wide range of appropriate tools and materials.  - Independent work with only some guided input.  - Some knowledge of making for batch production.  - Health and safety is demonstrated in their work. | -Design and / or product specification contains major topics.  - Manufacturing plan contains basic stages, may use a chart format as well as verbal.  - Some tools techniques and processes identified, verbally or written  - May have a basic CAD dimensioned drawing.  - Basic materials choices correctly made.  - Evidence of making log (if needed) is basic. | Work covering some of the following areas is evidenced *(in for instance GCSE design work)* and largely independently produced:  - evaluation of existing products with some areas of ACCESSFM areas being noted;  - some evaluation of past and present professional designers;  - on going analysis of some aspects of their work, including against the requirements of a specification;  - Some modifications and changes are made / suggested as a result. | - Students are able to evidence use and understanding of most areas of KS3 *(See relevant National Curriculum document for details.)* TK covered in class.  Summative assessments may be used to back this up.  - They can use and apply some this knowledge independently. This may be verbally, practically or in written work.  - Exam paper questions commanding (including higher order thinking skills) are answered to a grade 4 standard. | 105 | 104 | 103 | 102 | 101 |
| 5 | Some ideas are imaginative and creative. Good communication is evident.  Ideas are presented using a range of techniques which may include sketching, perspective, crating and CAD.  Different design strategies explored.  The designer has taken into account design criteria and ongoing research.  Some design may be evident. | - Outcome requires a wide range of skills to complete.  - Good quality make.  - Good accuracy shown.  - Made within deadlines.  - Can Select a wide range of appropriate tools, techniques, machinery and materials.  - Student can use basic working drawings and manufacturing specifications.  - Independent work with only some guided input.  - Some knowledge of making for batch production evidenced including CAD CAM.  - Health and safety is demonstrated in their work. | - Design brief relates to the context investigated.  - A design specification that shows links to the needs of the user.  - Manufacturing (product) specification would include the following:  - Dimensioned drawing using CAD contains most sizes required for production.  - Cutting list details most parts.  - Attempt at costings made.  - Some quality control points noted.  - Most materials, tools and techniques choices made with some justification.  Planning (if asked for)  - Major production stages planned out using charts or stages  - Can converse about what needs doing next.  - Evidence of making log shows how prototype has been produced. | Work covering most of the following areas is evidenced (*in for instance GCSE design work)* and independently produced:  - evaluation of existing products with areas of ACCESSFM areas being used;  - Evaluation of past and present professional designers;  - on going iterative analysis of some aspects of their work, including against the requirements of a specification;  - Some ongoing modifications and changes are made / proposed as a result.  Final evaluation will refer to the design brief and specification and will include some feedback from third parties, proposed and undertaken modifications | - There is emerging evidence of some GCSE *(see exam board specification for detailed listings)* TK being independently implemented in some areas of their work.  Summative assessments may be used to back this up.  - They can use and apply this knowledge increasingly independently. This may be verbally, practically or in written work.  - They can converse using some relevant technical language on many topics.  - Exam paper questions commanding (including higher order thinking skills) are answered to a grade 5 standard. |  | 105 | 104 | 103 | 102 |
| 6 | Ideas are imaginative and creative. Some show complexity.  Good – very good communication is evident.  Ideas are different to the majority of their peers.  Ideas are presented using a range of techniques which may include sketching, exploded diagrams, perspective, crating and CAD.  A range of strategies (including modelling) to develop appropriate ideas may have been used.  The designer has responded appropriately to design criteria and ongoing research.  Design fixation has been mainly avoided. | - Student can select most of their own tools, materials and techniques.  - CAD CAM used with assistance  - Modelling has been used to reasonable effect.  - Outcome is of good quality made mostly within tolerance.  - Completed within time deadlines.  - Student can use relevant working drawings and manufacturing specifications.  - Outcome requires a wide range of skills to complete, using a variety of materials.  - Some use of templates and jigs has been made or discussed.  - Health and safety is ingrained in their work.  Some quality control points identified and evidenced.  The outcome could be commercially viable and meets most of the needs of the user. | - Design brief relates to the context investigated.  - Clear design specification that shows links to the needs of the user.  - Manufacturing (product) specification would include the following:  - Dimensioned drawing using CAD is scaled and contains most sizes required for production.  - Cutting list is mostly accurate.  - Costings made are mostly realistic.  - Major quality control points noted.  - Materials, tools and techniques choices made with some justification.  Planning (if asked for)  - Major production stages planned out using charts or stages  - Can converse about what needs doing next.  - Evidence of making log shows how prototype has been produced. | Work covering the following areas is evidenced *(in for instance GCSE design work)* and independently produced:  - evaluation of existing products with most areas of ACCESSFM areas being commented on;  - Evaluation of past and present professional designers influences their own design;  - on going iterative analysis of their work, including against the requirements of a specification;  - Some ongoing modifications and changes are made / proposed as a result.  Final evaluation must refer to the design brief and specification and will include feedback from third parties, proposed and undertaken modifications | - There is evidence of GCSE *(see exam board specification for detailed listings)* level TK being independently implemented in most areas of their work.  - Summative assessments back up this level of progress.  - They have a good grasp of most areas.  - They can converse using most relevant technical language on many topics.  - Exam paper questions commanding (including higher order thinking skills) are answered to a grade 6 standard. |  |  | 105 | 104 | 103 |
| 7 | Ideas are imaginative and creative. Some ideas are demanding.  Good – very good communication is evident.  Ideas are different to the majority of their peers.  Ideas are presented using a range of techniques which may include sketching, exploded diagrams, perspective, crating and CAD.  A range of strategies to develop appropriate ideas is evident including modelling / prototyping. Reasoned material and component choices made.  The designer has responded appropriately to detailed design criteria and ongoing research.  Design fixation has been mainly avoided. | - Student has correctly selected most of their own tools, materials and techniques including some CAD CAM.  - Modelling has been used to good effect.  - Outcome is of high quality made mostly within tolerance.  - completed within time deadlines.  - Student can use realistic working drawings and manufacturing specifications.  - Outcome requires a range of demanding skills to complete, using a variety of materials.  - Some use of templates and jigs has been evidenced.  - Health and safety is ingrained in all aspects of their work.  Quality control points identified and used.  The outcome is commercially viable and meets the needs of the user. | - Design brief relates to the context investigated.  - Clear design specification that links to the needs of the user.  - Manufacturing (product) specification would include the following:  - Dimensioned drawing using CAD is scaled and contains most sizes required for production.  - Cutting list is mostly accurate.  - Costings made are realistic.  - Quality control points noted.  - Materials, tools and techniques choices justified.  Planning (if asked for)  - Most major production stages planned out using charts or stages  - Can converse in detail about what needs doing next.  - Evidence of making log shows how prototype has been produced. | Work covering the following areas is evidenced *(in for instance GCSE design work)* and independently produced:  - Thorough evaluation of existing products with all relevant areas of ACCESSFM areas being commented on;  - Evaluation of past and present professional designers clearly influences their own designs;  - on going iterative analysis of their work, including against the requirements of a specification;  - Ongoing modifications and changes are constantly made / proposed as a result.  Final evaluation must refer to the design brief and specification and will include feedback from third parties and detailed proposed and undertaken modifications | - There is good evidence of TK being independently implemented in most areas of their work (both verbally and work inspections).  - Summative assessments back up this level of progress.  - They have a reasonable grasp of most areas.  - They can converse using good technical language on most topics.  - Exam paper questions commanding (including higher order thinking skills) are answered to a grade 7 standard. |  |  |  | 105 | 104 |
| 8 | Ideas are imaginative, creative and some risks have been taken.  Communication of ideas is very good – excellent.  Ideas are different to the majority of their peers.  Ideas are presented using a range of techniques, including sketching, exploded diagrams, perspective, crating and CAD.  A range of strategies to develop appropriate ideas is evident including modelling / prototyping. Detailed material and component choices made. The designer has responded appropriately to detailed design criteria and ongoing research.  Design fixation has been avoided. | - Student has correctly selected their own tools, materials and techniques including some CAD CAM.  - Modelling has been used to very good effect.  - Outcome is of high quality made mostly within tolerance.  - completed within time deadlines.  - Student can use detailed working drawings and manufacturing specifications.  - Outcome requires a range of demanding skills to complete, using a variety of materials.  - Use of production aids such as templates and jigs has been evidenced.  - Health and safety is ingrained in all aspects of their work.  Quality control points identified and used.  The outcome is commercially viable and fully meets the needs of the user. | - Clear design brief that relates to the context investigated.  - Comprehensive Design specification that links to the needs of the user.  - Manufacturing (product) specification would include the following:  - Dimensioned drawing using CAD is scaled and contains sizes required for production.  - Cutting list is comprehensive and mostly accurate.  - Costings made are realistic.  - Quality control points noted.  - Materials, tools and techniques choices justified.  Planning (if asked for)  - Most major production stages planned out using charts or stages  - Can converse in detail about what needs doing next.  - Evidence of making log shows how prototype has been produced. | Work covering the following areas is evidenced *(in for instance GCSE design work)* and independently produced:  - Thorough evaluation of existing products with all relevant areas of ACCESSFM areas being thoroughly commented on;  - Evaluation of past and present professional designers clearly influences their own designs;  - on going iterative analysis of their work, including against the requirements of a specification;  - Ongoing modifications and changes are constantly made / proposed as a result.  Final evaluation must refer to the design brief and all areas of the specification and will include comprehensive feedback from third parties and detailed proposed and undertaken modifications. | - There is plentiful evidence of TK being independently implemented in all areas of their work (both verbally and work inspections)  - Summative assessments back up this level of progress.  - They have a very good grasp of most areas.  - they can converse using relevant technical language.  - exam paper questions commanding higher order thinking skills are consistently answered to a high (grade 8) standard. *(see exam board specification for detailed listings)* |  |  |  |  | 105 |
| 9 | Ideas are imaginative, creative and risks have been taken.  Excellent communication is evident.  Ideas are different to the majority of their peers.  Ideas are presented using a range of techniques, including sketching, exploded diagrams, perspective, crating and CAD.  A range of strategies to develop appropriate ideas is evident including modelling / prototyping. Detailed material and component choices made.  The designer has responded appropriately to detailed design criteria and ongoing research.  Design fixation has been avoided. | - Student selected their own tools, materials and techniques including CAD CAM.  - Modelling has been used to very good effect.  - Outcome is of very high (professional) quality made within tolerance.  - completed within realistic time deadlines.  - Student can use detailed working drawings and manufacturing specification.  - Outcome requires a wide range of demanding skills to complete, using a variety of materials.  - Good use of templates and jigs has been evidenced  - Health and safety is ingrained in all aspects of their work.  - Students may show aspects of skills that go beyond GCSE standard. This will often be as a result of personal interests pursued in addition to, and outside of, lesson time. Such skills can be used in relevant areas of their practical work and nurtured in extra time at school. | - Clear design brief that relates to the context investigated.  - Comprehensive Design specification that links to the needs of the user.  - Manufacturing (product) specification would include the following:  - Dimensioned drawing using CAD is scaled and contains sizes required for production.  - Cutting list is comprehensive and accurate.  - Costings made are realistic.  - Quality control points noted.  - Materials, tools and techniques choices justified.  Planning (if asked for)  - All major production stages planned out using charts or stages  - Can converse in detail about what needs doing next.  - Evidence of making log clearly shows how prototype has been produced. | Work covering the following areas is evidenced *(in for instance GCSE design work)* and independently produced:  - Thorough evaluation of existing products with all relevant areas of ACCESSFM areas being thoroughly commented on;  - Evaluation of past and present professional designers clearly influences their own designs;  - on going iterative analysis of their work, including testing against the requirements of a specification;  - Ongoing modifications and changes are constantly made / proposed as a result.  - Final evaluation must refer to the design brief and all areas of the specification and will include comprehensive feedback from third parties and detailed proposed and undertaken modifications. | - There is extensive evidence of TK being independently implemented in all areas of their work (both verbally and work inspections).  - Summative assessments back up this level of progress.  - They have a thorough grasp of most if not all areas.  - they can converse using relevant technical language.  - All exam paper questions commanding higher order thinking skills are consistently answered to a very high (grade 9) standard.  *(see exam board specification for detailed listings)*  - Students may show areas of TK that go beyond GCSE standard. This will often be as a result of personal interests. Conversations with these students may help further this knowledge and nurture a future interest in higher education. |  |  |  |  | 105 |