Tonacliffe Primary School Design and Technology Progression Document – Structures

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| **EYFS** | Experience of using construction kits to build walls, towers and frameworks.  Experience of using of basic tools e.g. scissors or  hole punches with construction materials e.g.  plastic, card.  Experience of different methods of joining card and paper. | | |
|  | **KS1** | **LKS2** | **UKS2** |
| **Designing** | Generate ideas based on simple design criteria  and their own experiences, explaining what they  could make.  Develop, model and communicate their ideas  through talking, mock-ups and drawings. | Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product.  Develop ideas through the analysis of existing shell structures and use computer-aided design to model and communicate ideas. | Carry out research into user needs and existing  products, using surveys, interviews,  questionnaires and web-based resources.  Develop a simple design specification to guide the  development of their ideas and products, taking  account of constraints including time, resources  and cost.  Generate, develop and model innovative ideas,  through discussion, prototypes and annotated  sketches. |
| **Making** | Plan by suggesting what to do next.  Select and use tools, skills and techniques suitable  for the task, explaining their choices.  Select new and reclaimed materials and  construction kits to build their structures.  Use simple finishing techniques suitable for the  structure they are creating. | Plan the order of the main stages of making.  Select and use appropriate tools and software to measure, mark out, cut, score, shape and assemble with some accuracy.  Explain their choice of materials according to functional properties and aesthetic qualities.  Use computer-generated finishing techniques suitable for the product they are creating. | Formulate a clear plan, including a step-by-step list  of what needs to be done and lists of resources to  be used.  Competently select from and use appropriate tools  to accurately measure, mark out, cut, shape and  join construction materials to make frameworks.  • Use finishing and decorative techniques suitable  for the product they are designing and making. |
| **Evaluating** | Explore a range of existing freestanding structures  in the school and local environment e.g. everyday  products and buildings.  Evaluate their product by discussing how well it  works in relation to the purpose, the user and  whether it meets the original design criteria. | Investigate and evaluate a range of shell structuresincluding the materials, components and techniques that have been used.  Test and evaluate their own products against design criteria and the intended user and purpose. | Investigate and evaluate a range of existing frame  structures.  Critically evaluate their products against their  design specification, intended user and purpose,  identifying strengths and areas for development,  and carrying out appropriate tests.  Research key events and individuals relevant to  frame structures. |
| **Technical knowledge and understating** | Know how to make freestanding structures  stronger, stiffer and more stable.  Know and use technical vocabulary relevant to the  project. | Develop and use knowledge of nets of cubes and cuboidsand, where appropriate, more complex 3D shapes.  Develop and use knowledge of how to construct strong, stiff shell structures.  Know and use technical vocabulary relevant to the project. | Understand how to strengthen, stiffen and  reinforce 3-D frameworks.  Know and use technical vocabulary relevant to the  project. |
| **Key Vocab** | cut, fold, join, fix  structure, wall, tower,  framework, weak, strong,  base, top, underneath,  side, edge, surface,  thinner, thicker, corner,  point, straight, curved  metal, wood, plastic  circle, triangle, square,  rectangle, cuboid, cube,  cylinder  design, make, evaluate,  user, purpose, ideas,  design criteria, product,  function | shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity  marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating  font, lettering, text, graphics, decision, evaluating, design brief design criteria, innovative, prototype | frame structure, stiffen,  strengthen, reinforce,  triangulation, stability,  shape, join, temporary,  permanent  design brief, design  specification, prototype,  annotated sketch,  purpose, user, innovation,  research, functional |