

<b>Teacher(s)</b>	<b>Manish Kumar</b>	<b>Subject group and discipline</b>	<b>Design</b>		
<b>Unit title</b>	<b>Pull along toys</b>	<b>MYP year</b>	<b>2</b>	<b>Unit duration (hrs)</b>	<b>12</b>

**Inquiry: Establishing the purpose of the unit**

<b>Key concept</b>	<b>Related concept(s)</b>	<b>Global context</b>
<b>Development</b>	<b>Resources</b>	<b>Fairness and Development</b>

**Statement of inquiry**

How simple mechanism work helps one understand local material viabilities, processes, finishing styles and leads to development.

**Inquiry questions**

**Factual—** What all materials can you come up with for this product?  
 What all materials, of the ones available in the lab, would you consider, for such a product?  
 Why would your product be a better solution than any existing ideas?  
 What comes in your mind when you think of toys for children? (colours/shapes/textures/safety/materials/glues)  
 Think of 3 traditional toys and their construction details.  
 Draw three types of wood joints.  
 What do you understand by filing and finishing?  
 What are the types of glues?  
 List the factors that might affect the working on your product.  
**Conceptual—** Why is there and what is the need for educational toys?  
 What are the ways to develop a plan for production? And how relevant would be a flow chart?

**Debatable— To what extent can industrial processes support traditional crafts as a means to learn indigenous systems?**

Objectives	Summative assessment	
<p><b>C- Creating the Solution:</b> In this objective student will plan the creation of the given design brief and follow the plan to create a prototype sufficient for testing and evaluation. In order to reach the aims of this objective student will cover following points:</p> <ul style="list-style-type: none"> <li>i. Outline a plan, which considers the use of resources and time, sufficient for peers to be able to follow to create the solution</li> <li>ii. Demonstrate excellent technical skills when making the solution</li> <li>iii. Follow the plan to create the solution, which functions as intended</li> <li>iv. List the changes made to the chosen design and plan when making the solution</li> <li>v. Present the solution as a whole.</li> </ul> <p>This will help students in developing their thinking skills, communication skills and research skills.</p>	<p>Outline of summative assessment task(s) including assessment criteria:</p> <p>In this unit students will know and understand various hand tools and materials by creating a product <i>Pull Along Toy</i>.</p> <p>Initially students will outline a construction plan for their product which is a pull along toy, this construction plan includes all the resources that student needs to build their product and time require to create the product.</p> <p>After this student will start creating their product using various tools and techniques. To create their solution student will follow their construction plan and list the changes they need to make to build their final product.</p> <p>At the end students will present their solution and submit it as their summative assessment. In the presentation students will include the construction plan, building process and the changes they made.</p>	<p>Relationship between summative assessment task(s) and statement of inquiry:</p> <p>To deveope motor skills and to improve social skills of kids, students in this unit will design pull along toys by considering ergonomics factors and to make these toys aesthetically pleasing students will use their cultural expressions like symbols, shapes, colours etc.</p>

**Approaches to learning (ATL)**

**Thinking skills:** While considering timelines, materials, basic processing, tooling and joineries for their proposed solution, students will develop and hone their thinking and analytical skills through the development of the construction plan.

**Communication skills:** Collaborative feedback and assessment will help students build their communication skills. Presenting their realised products would allow them to communicate through other visual languages such as 3 dimensional model making and finishing of the product to provide a functional and high quality product.

**Research skills:** Along with developing of a functional product, quality finishing must be an attribute to consider for users to be attracted to buy.

**Action: Teaching and learning through inquiry**

Content	Learning process
<p><u>Students will know the following content:</u></p> <ul style="list-style-type: none"> <li>- Revision of previously learnt factors through practical developments.</li> <li>- Understanding viability of local materials for the production of proposed ideas.</li> <li>- Understanding and analysing tooling and processes locally viable against industrially possible, to be able to find alternatives.</li> <li>- Along with finding alternatives, understanding ways to develop a plan for production.</li> <li>- Students will understand different planning and presentation techniques like flow chart, algorithms etc.</li> </ul> <p><u>Students will develop the following skills:</u></p> <ul style="list-style-type: none"> <li>- Learning and revision of different cutting and joining techniques.</li> <li>- Develop skills and understanding working with Paper, MDF, Cardboards, and Paper cutter, Glue, Filer, Hacksaw and Sand Paper.</li> <li>- Developing a flow chart along with undertaking decisions wherever a fault may occur</li> <li>- Figuring alternate routes to product realisation – for processes, materials, joining and finishing.</li> <li>- Organisational and Analytical skills when planning the</li> </ul>	<p><b>Learning experiences and teaching strategies</b></p> <p>Using discussions to hone previously learnt skills and understanding students will discuss possible areas of intervention for the topic – ‘pull down toys’.</p> <p>Using charts students will collaboratively present possible materials for the development of the toys, along with feasible options from the DT lab.</p> <p>A flow chart would allow students working individually or in groups, to find ways to develop their proposed idea/s.</p> <p>Possible finishes will also be discussed further through case studies and research.</p> <p>Workshop skills will allow students to develop products while giving due consideration to safety and respecting the environment – be it colleagues, workspace, materials or tools.</p> <p>Experiences will allow students to work within and beyond their comfort zone, to hone their skills and patience.</p> <p>To present their thought for the development processes for the Inquiry-Based Learning (IBL), students shall work with direct instructions as well as hands on experiences within groups or as individuals. Mind mapping and other graphical models will also be discussed.</p> <p>IBL: Guided inquiry into efficient and proper use of hand tools and materials.</p> <p>IBL: Open inquiry into the different materials available in the lab.</p> <p>IBL: Structured inquiry around the building plan of the solution.</p> <p>Small group/pair work</p> <ul style="list-style-type: none"> <li>- Power lecture/notes</li> <li>- Individual presentations</li> <li>- Group presentation</li> </ul>

<p>sequence for construction</p> <ul style="list-style-type: none"> <li>- Product finishing quality and control</li> <li>- Working with hand tools such as cutting of paper and cardboard using paper cutter; cutting of MDF using hacksaw.</li> <li>- Communication skills of the students will also develop during the development and presentation of their product.</li> </ul> <p><u>Do:</u></p> <p>Using various/alternative materials, hand-tools, joining methods and experiential techniques students will build a <i>pull along toy</i>.</p>	<p><b>Formative assessment</b></p> <p>Exercise 1 – This FA would be based on strand-1 which is <b>outline a plan, which considers the use of resources and time, sufficient for peers to be able to follow to create the solution</b>. Objective of this FA is to test and improve student’s thinking skills and their understanding of creating a construction plan using various planning and presentation techniques. The task for this FA would be to create a construction plan to make a 7cmx7cmx7cm box using MDF.</p> <p>Exercise 2 {Group assignment} –This FA would be based on the strand-ii, strand-iii and strand-iv. Which are: -</p> <ul style="list-style-type: none"> <li>ii. <b>demonstrate excellent technical skills when making the solution</b></li> <li>iii. <b>follow the plan to create the solution, which functions as intended list the changes made to the chosen design and plan when making the solution</b></li> <li>iv. <b>Present the solution as a whole.</b></li> </ul> <p>Objective of this assessment is to test and improve student’s technical skills, communication skills and presentation skills. Task for this FA is to create a 7cmx7cmx7cm box using MDF and various hand tools.</p> <p><b>Differentiation</b></p> <p>While an end product needs technical understanding, product planning and development can be presented through a variety of mediums such as sketches/3D modelling/CAD. Students will develop skills to hone not only their analytical skills but also organisational.</p> <p>Planned sequencing will allow them to see their thoughts more clearly while developing a functional product.</p> <p>Along with creating high quality products, it is important to understand the ecology, resource management and viability of materials and processes in a given setup.</p> <p>Every concern can have different viewpoints, and it is important to see different possibilities. Students must try alternative to find the most suitable approach for the chosen opportunity (design problem).</p>
<p><b>Resources</b></p>	

<https://www.youtube.com/watch?v=1hmdVC6pMdU> – to develop ideas by observing various available toys in the market.

<https://www.youtube.com/watch?v=jz13j0p408o> – to understand the building process of a toy.

<https://www.youtube.com/watch?v=zg0MmD0YTgo> – to understand the building process of a pull along toy.

<https://makezine.com/projects/build-a-classic-wobble-duckie-pull-toy/> - to understand the building process of a pull along toy in detail.

**Reflection: Considering the planning, process and impact of the inquiry**

Prior to teaching the unit	During teaching	After teaching the unit
<p>Check previous understanding of the students. Arrange all the media content.</p> <p>I believe students will enjoy this unit because they will get a chance to explore new materials and machines. Students will also get a chance to apply their science and mathematics concepts like force, friction, measurements ect.</p>		

<b>Teacher(s)</b>	<b>Manish Kumar</b>	<b>Subject group and discipline</b>	<b>Design</b>		
<b>Unit Title</b>	<b>Best Insulating Material</b>	<b>MYP Year</b>	<b>ii</b>	<b>Unit duration (hrs)</b>	<b>12</b>

**Inquiry: Establishing the purpose of the unit**

<b>Key Concept</b>	<b>Related Concept</b>	<b>Global Context</b>
Community	Form, Evaluation	Fairness and Development

**Statement of inquiry**

By carefully observing and evaluating the sound and thermal property of materials one can improve living standard of the community.

**Inquiry questions**

**Factual— Explain design cycle.**

**Explain design brief and design specification.**

**What do you understand by primary research and secondary research?**

**What do you understand by the term aesthetic and ergonomics?**

**What are the main factors that influence the success of a new product in the market?**

**What do you understand by the term insulation?**

**Explain different types of insulation.**

**What are common insulating materials?**

**How heat flows in solids, liquids and gases?**

**What are the advantages of using insulation?**

**What are composites?**

**Explain different types of insulation.**

**Conceptual— How insulation helps in saving electrical energy?**

**How composites improve the properties of materials?**

**Debatable— To save energy should government pass laws to make insulation compulsory?**

Objectives	Summative assessment	
<p>In this unit students will cover two objectives of design, objective A {Research and Analysis} and objective B {Developing Ideas}</p> <p><b>A- Research and Analysis:</b> Design research is the first step in product designing; it helps the students in understanding the needs, requirement and working process of the product. By doing research student understand their client and the problem which they want to solve through their design. In research work students will cover the following points:</p> <ol style="list-style-type: none"> <li>I. Explains and justifies the need for a solution to a problem</li> <li>II. States and prioritizes the main points of research needed to develop a solution to the problem, with minimal guidance</li> <li>III. Describes the main features of an existing product that inspires a solution to the problem</li> <li>IV. Present the main findings of relevant research</li> </ol> <p>This will help students in developing their thinking skills, communication skills and research skills.</p> <p><b>B- Developing Ideas:</b> In this objective student will do brainstorming to develop a</p>	<p>Outline of summative assessment task(s) including assessment criteria:</p> <p>In the summative assessment a problem will be introduced to the students. Students have to research on that problem and develop a design brief, for the first students have to prepare a questionnaire based on the problem, now students will go to client/user to fill up their questionnaire. Now, after analysing the questionnaire students will up with a design brief and this design brief will help them to build a solution. This task will cover objective A of design process which is Research and Analysis.</p> <p>To cover objective B, a problem with design brief will be given to students. Student will understand the design brief and develop ideas to solve the problem. Students will represent their ideas through annotated drawings. After developing their ideas students will present their ideas.</p> <ul style="list-style-type: none"> <li>- Need for a solution.</li> <li>- Factors affecting the solution.</li> <li>- Research on existing solutions.</li> <li>- Design specification</li> <li>- Success criteria</li> <li>- Sketches of all possible solutions</li> <li>- Final solution with annotated sketch and with</li> </ul>	<p>Relationship between summative assessment task(s) and statement of inquiry:</p> <p>Students will have an understanding of the importance of insulation, how it helps in saving energy, its applications and will try to solve some daily life problems through insulation. Students will use natural resources to build their solution. By doing so, students will help in saving energy, and solve basic daily life problems, and help community by providing low cost, energy saving and made from natural resources of insulating alternatives.</p>

<p>solution to the given problem and represent their solution with the help of detailed design drawings.</p> <p>There are four strands in this objective in which students first- Identify a problem that needs a solution, identify their clients/users and write a detail design specification by considering all design factors like aesthetic, ergonomics, cost and materials after this students will come up 3-4 possible design solutions and represent them with the help of drawings. Out of all their possible solutions finally students will select one final solution and justify. In final strand students have to represent their final solution with the help of detailed drawings.</p>	<p>proper justification.</p>	
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**Approaches to learning (ATL)**

Tinking skills: While considering and prioritizing the factors that may affect the design, and at the time of developing ideas for the solution students will build their critical and creative thinking skills.

Communication skills: During their research work students will interview the users/clients which will help them to build their communication skills. In this unit students will work in groups in a collaborative manner this will also build their communication skills while they will be sharing ideas in their groups.

Research skills : Research is the first and important step in design process in this unit students will do research on different materials to test their insulation property and on the existing solution so that they can identify how these solutions work get ideas from these existing solution to design a better solution.

**Action: Teaching and learning through inquiry**

Content	Learning process
<p><u>Students will know the following content:</u></p> <ul style="list-style-type: none"> <li>- Students will understand the importance of 'research' in designing a solution</li> <li>- Students will understand primary research and secondary research.</li> <li>- Students will understand the various factors which affect the designing of a solution like aesthetic, ergonomics, environmental</li> </ul>	<p><b>Learning experiences and teaching strategies</b></p> <p>Inquiry-Based Learning (IBL): Direct instruction with inquiry: Mind mapping possible project ideas and constraints in small groups;</p> <p>IBL: Guided inquiry into techniques that can be used to remove different impurities of water.</p> <p>IBL: Open inquiry into the different materials available in the lab.</p> <p>IBL: Structured inquiry around the research plan. Students identify research questions</p>

<p>conditions, cost, function etc. and how to prioritize these factors.</p> <ul style="list-style-type: none"> <li>- Students will learn how to prepare a design specification and which factors needs to be considers while designing a design brief.</li> <li>- Students will understand that different materials have different properties</li> <li>- Students will learn how case studies and existing solutions can inspire us to design a better solution through brainstorming</li> <li>- Students will understand how insulation can help us in energy saving</li> <li>- Students will understand that heat flows through different methods in different materials.</li> </ul> <p><u>Students will develop the following skills:</u></p> <ul style="list-style-type: none"> <li>- Students, with the help of some examples will be able to identify &amp; define the 4 stages of design cycle.</li> <li>- Students will improve their drawing skills with an annotated analysis of their thoughts in the form of sketches and diagrams to refine an idea and in the process improve it further.</li> <li>- Students will also improve their research skills along with observation and analytical understanding while drawing conclusions.</li> <li>- Communnication skills of the students will also develop during the research process, during interviewing the client and during their group work</li> <li>- Students will become better thinkers, communicators and principled in their approach.</li> </ul>	<p>about the water impurities and filtration materials.</p> <ul style="list-style-type: none"> <li>- Small group/pair work</li> <li>- Power lecture/notes</li> <li>- Individual presentations</li> <li>- Group presetation</li> </ul>
<p><u>Students will grasp the following concepts:</u></p> <ul style="list-style-type: none"> <li>- Design cycle</li> <li>- Primery and secondary research</li> </ul>	<p><b>Formative assessment</b></p> <p>Exercise 1 – In summers we use a lot of energy to keep our houses cold and in the same way in winters we use a lot of electrical energy to keep our houses warm. Through insulation we can solve this problem. In this exercise, students will identify any such problem which they think they can solve through insulation and then do their research. In the research students will cover the following points.</p> <ul style="list-style-type: none"> <li>- Explains and justifies the need for a solution to a problem</li> <li>- States and prioritizes the main points of research needed to develop a solution to the problem, with minimal guidance</li> <li>- Describes the main features of an existing product that inspires a solution to the problem</li> <li>- Present the main findings of relevant research</li> </ul> <p>This will help students in building their research skills, thinking skills and communication skills.</p> <p>Exercise 2 –Students will preprare a design specification based on their research work and develop ideas through brainstorming to solve the given problem. Students will present their idea through annotated sketches and finaly explains the manufacturing process of the one final design. At the end students will prepare a power point presentation in which they will represent the design specification, annotated sketches, and justify the final chosen design.</p> <p>This exercise will help students to build their thinking skills, drawing skills and presentation skills.</p> <p><b>Differentiation</b></p> <p>ESL: Therer is no need for this, besides breaking down the requirments of the solution and the project into simpler language where required and giving more clear instructions throughout the stages of the project.</p> <p>Extended Learning: The end product will depend on the technical skills of the student. For example making the water filter students will have to use different tools and</p>

<ul style="list-style-type: none"> <li>- Design brief</li> <li>- Design specification</li> <li>- Insulation property of materials.</li> <li>- Different methods of heat transfer..</li> <li>- One point perspective drawings</li> <li>- Two point perspective drawings</li> <li>- Shading</li> <li>- Design specification</li> </ul>	<p>machines.</p>
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**Resources**

<http://www.ruthtrumpold.id.au/destech/>  
<https://www.mighome.com/how-does-insulation-work>  
<http://electron6.phys.utk.edu/101/CH7/Heat%20Flow.htm>  
[http://www.physics4kids.com/files/thermo\\_intro.html](http://www.physics4kids.com/files/thermo_intro.html)  
<https://www.youtube.com/watch?v=l81M7Xhwzk0>  
<https://www.youtube.com/watch?v=yIvfS7gENs4>

**Reflection: Considering the planning, process and impact of the inquiry**

Prior to teaching the unit	During teaching	After teaching the unit
<p><b>Why do we think this unit will be interesting?</b>            This unit integrates science and design, and provides freedom to students to apply their science knowledge in design to solve common daily life problem related to insulation. Students will do experiments on different materials like paper, wood, metal, cotton and Styrofoam and design an economical insulating solution. Students will also get a chance to make composites</p> <p><b>What do the students already know? What can they</b></p>		

do?

Students know that in summer people use ACs to keep their house cool, and in winter they use heaters to keep their house warm, but this process requires a lot of electrical energy. Students know that heat flows from high temperature to lower temperature.

In this unit students will do research on the available solutions of this problem and how do they work.

Students will understand the thermal properties of materials and how heat flow in different states of matter. Finally students will develop ideas to design economical insulating solutions using locally available material.

**What does my experience tell me to expect?**

I think students would really enjoy this unit, they will come up with many ideas where we can use insulation. Students will understand how insulation is applied in their daily life products like thermos bottle, jacket, house etc.

**What attributes of the learner profile do I expect the students to develop?**

Through this unit students will build their Research skills, thinking skills and communication skills.

While students will research on different materials they will develop their research skills and become researchers. When they will think to develop a better solution they will act as thinkers. When students will communicate with their clients to understand their problems they will act as communicators.

**What are potential interdisciplinary connections?**

This unit integrates the science with design; in science students learn the concept of heat flow, here in design students can apply this knowledge to build a new product and to solve community problems.

**Are there opportunities for meaningful service learning?**

Yes, through this unit students can provide better alternatives of ACs, heaters to poor people who can not afford these costly solutions. Students will

<p>develop ideas to build their solutions using economical and locally available materials.</p> <p>What in the unit might inspire community/personal projects?</p> <p>Concept of insulation applies in our daily life, we use thermos bottle to keep our milk/tea hot or cold, in winters we use jacket to keep our body temperature normal all these are examples of insulation in daily life which will inspire students to improve these solutions, or to come up with a completely new solution.</p>		
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<b>Teacher(s)</b>	Ravi Pargaien	<b>Subject group and discipline</b>	Design		
<b>Unit title</b>	Computer Programming	<b>MYP year</b>	2	<b>Unit duration (hrs)</b>	15

Inquiry:

<b>Key concept</b>	<b>Related concept(s)</b>	<b>Global context</b>
Logic	Form	Personal and cultural expression
<b>Statement of inquiry</b>		
The format of logical statements can be combined in innovative ways to create personal and cultural expressions.		
<b>Inquiry questions</b>		
<p><b>Factual—</b>  <i>What is a program?</i>  <i>What is an event?</i>  <i>What are event handlers?</i></p> <p><b>Conceptual—</b>  <i>How can simple commands be combined to create innovative instructions?</i></p> <p><b>Debatable—</b>  <i>Is there only a single way to use computer code to write a program?</i></p>		
<b>Objectives</b>	<b>Summative assessment</b>	

<p style="text-align: center;"><b>A, B</b></p>	<p><b>Outline of summative assessment task(s) including assessment criteria:</b></p> <p>Students will create a new world in minecraft(education edition). This world should reflect place they live in.</p> <p>Criteria:</p> <p>Inquiry: Student expresses a clear design brief explaining the idea and purpose of their design.</p> <p>Developing Ideas: Students will create a storyboard detailing the different parts and areas of their design.</p>	<p><b>Relationship between summative assessment task(s) and statement of inquiry:</b></p> <p>The summative assessment goes through the first three stages of design cycle. Inquiry, Development, and Creating.</p> <p>Students will show their own personal and cultural identity through the designed model.</p>
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**Approaches to learning (ATL)**

- I. **Communication:** share ideas with multiple audiences using a variety of digital environments and media.
- II. **Organization skills:** Set goals that are challenging and realistic.
- III. **Information Literacy skills:** understand and use technology systems.
- IV. **Media Literacy Skills:** communicate information and ideas effectively to multiple audiences using a variety of media and formats.
- V. **Creative thinking skills:** Use brainstorming and visual diagrams to generate new ideas and inquiries.

**Action: Teaching and learning through inquiry**

<p><b>Content</b></p>	<p><b>Learning process</b></p>
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Minecraft education edition – Introduction Hour of code – All three activities. Code connection using makecode. Connecting minecraft with code connection Events Event handlers Commands	
	<b>Formative assessment</b>
	<b>Differentiation</b>
<b>Resources</b>	
<b>Minecraft education edition</b>	

Reflection: Considering the planning, process and impact of the inquiry

Prior to teaching the unit	During teaching	After teaching the unit

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