

Planning Sheet: Terrific Toys for Tiny Tots!!

CURRICULUM INTENTION

Maths Level Statements

Level 2 Data:

Students collect and organise data, create and interpret a range of data displays and identify significant elements of the displays. (...)

Level 2 Space:

Students sort 3D shapes and objects by identifying common properties, including those that distinguish them from 2D shapes. They identify and match drawings, pictures and other representations of 3D shapes and objects from different viewpoints and orientations. They investigate nets of some shapes...

Level 2 Measurement:

Students use ...some standard units to estimate, measure ...length, mass, area...They understand that the larger the unit, the fewer required to measure an object, and that standard units provide consistency when measuring.

Level 2 Number:

Students are beginning to recall or work out some addition, subtraction and multiplication number facts. They use a range of computation methods, including mental, written and calculator, to solve problems.

Technology Level Statements

Level 2 Information:

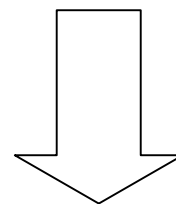
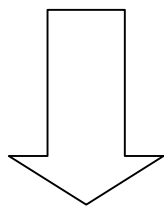
Students explain the purposes of various forms of information used in everyday life. They use simple techniques for accessing and presenting information.

Level 2 Technology Practice:

Students organise information gathered to meet a design challenge and use annotated drawings to communicate their design ideas. They identify, sequence and follow production procedures to design and make products. Students compare their design ideas with the final products.

Level 2 Materials:

Students match the characteristics of materials to the design requirements of products. They select and use suitable equipment and techniques for manipulating and processing materials.



Key Concepts

- Geometric properties of 2D and 3D shapes
- Units of measurement
- Data manipulation

Key Processes

- Working mathematically.
- Collaborating and cooperating.

Key Concepts

- The nature of Information
- The nature of design
- The nature of materials

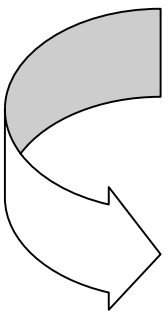
Key Processes

- Working technologically

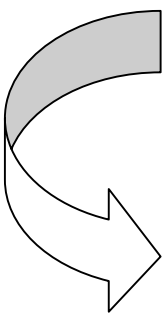
Key Values

- Appropriateness – functional, social, aesthetic.

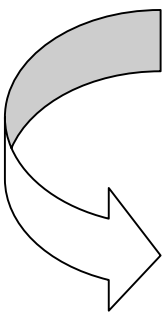
IF THE DESIRED RESULT IS FOR LEARNERS TO UNDERSTAND THAT...

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- The type (sources and forms) of information gathered influences decision-making and problem solving.
 - Displaying data in a table, chart or graph aids our understanding and use of the data.
 - 2D and 3D shapes can be sorted into families of shapes according to their properties.
 - 3D objects are made up of 2D shapes.
 - Some shapes are more appropriate for particular purposes.
 - Standard units of measurement provide a common language for describing, comparing, ordering, selecting and grouping objects.
 - The larger the standard unit, the fewer required to measure and vice-versa.
 - A design requires a brief that identifies the needs and purposes of the product.
 - Designing involves investigating, ideating, producing and evaluating.
 - Materials have characteristics that need to be considered in design and construction.
 - Working in a team offers more options for creating and refining products.

Then you need evidence of the student's ability to:

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- Collect, display and interpret comparative data from a variety of sources.
 - Classify 2D and 3D shapes according to their geometric properties.
 - Make judgments about how the properties of shapes determine their suitability for a child's toy.
 - Design, draw and replicate variations on 2D & 3D shapes.
 - Use measurement terms, attributes and units of measure.
 - Select and use standard units to measure length, mass, area.
 - Use design processes to develop an idea and/or a product.
 - Identify characteristics of materials and select materials for the design.
 - Work cooperatively in team situations.

Then the assessment tasks need to include:

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- A display and analysis of data that informs a design.
 - A record containing various items created during the process that demonstrates specific mathematical and technological challenges.
 - A design that requires visualisation and creation of 2D and 3D shapes and that requires appropriate judgments about properties and measurement.

Then the learning activities need to help students:

- Acquire knowledge about 2D and 3D shapes, their properties and attributes.
- Gather, interpret and represent data.
- Investigate the characteristics of various materials
- Make choices about the appropriateness of decisions about measurements.
- Share and compare choices about mathematical and technological solutions at various stages in the task.
- Record and reflect on each phase of the technology process. (Journal)
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Task Outline: Students explore data about toys that are appropriate for infants (0-12 months of age). Using these findings as well as their knowledge of shape, measurement and materials, they will report on a toy, currently on the market, that meets specified design requirements. They will then design a toy that can compete favourably in this market. They might also construct a prototype of this toy.

ATTENTION ALL TOY DESIGNERS!

Key Dates

Step 1- Exploring infant toys	Wks 1-2
Step 2- Investigating Shape and Measurement	Wks 3-4
Step 3- Investigating materials	Wk 5-6
Step 4- Preparing the Toy report	Wk 6-7
Step 5- Designing an original toy	Wks 8-9
Step 6- Appraising designs	Wk 9
Step 7- Making a Prototype.	Wk 10

Terrific Toys for Tiny Tots

Terrific Toys are looking for research and toy designs for infants (0-12 months of age).

We know it is good for infants to learn about regular shapes at an early age. Our company wants to produce a range of toys that will do this. We need you to conduct research and design in this area.

To do this:

1. Work in teams to research toys for infants and report on a toy already in the shops that is of the type we want to produce.
2. Use this research to help you design a new toy for infants.
3. (Optional.) Make a prototype of your toy.

You must use the following **design requirements**.

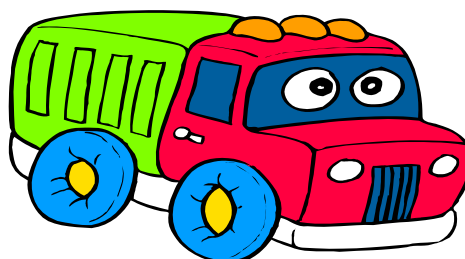
The toy we are looking for:

- will have at least one 3-D regular shape with flat sides
- will have at least three 2-D regular shapes
- is an appropriate size for infants
- is made of appropriate materials for infants
- is appealing to infants
- can be packed in one of our two basic containers:
 - a) a cube that has 20 cm sides,
 - b) a rectangular box with the measurements 130 x 140 x 280 mm.

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Points of interest:

- You will work in a team of 3-4 people.
- Good team work leads to good design.
- A folio of your team's work at key dates is required.



Terrific Toys For Tiny Tots – Task outline for students

Key dates	What your team will be working on	What your team will hand in
Weeks 1-2	<p><u>Exploring infant toys.</u></p> <ul style="list-style-type: none"> Identifying features of quality toys. Surveying toys for: <ol style="list-style-type: none"> Shape Size Materials. Appeal to infants. 	<p>Folio:</p> <ul style="list-style-type: none"> Graphs, charts and tables that display relevant information about toys. The group's journal on team work
Weeks 3-4	<p><u>Investigating shape and measurement.</u></p> <ul style="list-style-type: none"> Naming and describing 2D and 3D shapes (properties, terms and conventions). Drawing, measuring (units and tools) and manipulating shapes. Drawing nets Analysing commercial toys for the presence and appropriateness of 2D and 3D shapes. 	<p>Folio:</p> <ul style="list-style-type: none"> Selected samples of work across the 4 activities. The group's journal on team work
Weeks 5-6	<p><u>Investigating materials.</u></p> <ul style="list-style-type: none"> Exploring characteristics of materials. Matching material and construction types with use in toys and the needs of infants. 	<p>Folio:</p> <ul style="list-style-type: none"> Selected work samples to show investigation of materials. The group's journal on team work
Weeks 6-7	<p><u>Preparing the toy report.</u></p> <ul style="list-style-type: none"> Use data from your investigations. 	<p>A report that explains how the commercial toy you have selected meets each of the design requirements. Include data you have collected about shape, size, materials and appeal to support your case.</p>
Week 8-9	<p><u>Designing an original toy.</u></p> <ul style="list-style-type: none"> Reviewing your folio. Brainstorming and sketching. Designing. Gathering feedback and re-designing. 	<p>A design :</p> <ul style="list-style-type: none"> Present your team's design in an appropriate form (design board, power point ...) that includes: <ol style="list-style-type: none"> A sketch/diagram labelled with external dimensions. Packaging recommendations. Net of the 3D regular shape involved. Information about the material/s and colour/s chosen (samples where possible) Annotations/justification of how the toy meets the design requirements. The group's journal on team work
Week 9	<p><u>Appraising designs.</u></p> <ul style="list-style-type: none"> Sharing and evaluating designs. Providing feedback. 	<p>Folio:</p> <ul style="list-style-type: none"> Copy of feedback. Your team's response to feedback. The group's journal on team work
Week 10	<p><u>Making a prototype</u> (optional)</p> <ul style="list-style-type: none"> Make the toy Identify any problems in your design 	<p>Folio:</p> <ul style="list-style-type: none"> List of identified problems. The group's journal on team work

Terrific Toys for Tiny Tots

		Very High Achievement	High Achievement	Sound	Developing
Knowledges	<i>Knowing about:</i> <ul style="list-style-type: none"> • <i>data</i> • <i>space (shape)</i> • <i>measurement</i> 	2D and 3D shapes are described and classified accurately and appropriately in terms of their properties using mathematical terms and conventions. Accurately and effectively selects and uses a range of <ul style="list-style-type: none"> • units and tools of measurement • data display methods 	Describes 2D and 3D shapes using mathematical terms and conventions. Appropriately selects and uses a range of <ul style="list-style-type: none"> • units and tools of measurement • data display methods 	Identifies 2D and 3D shapes. Uses a variety of <ul style="list-style-type: none"> • units and tools of measurement • data display methods 	
	<i>Knowing about:</i> <ul style="list-style-type: none"> • <i>Information</i> • <i>materials</i> 	Selects and uses information on material characteristics, shapes and toys that is relevant to the design of the toy.	uses information about material characteristics, toys and shape appropriate for the product.	Uses appropriate information about materials.	<i>The student has submitted some work.</i>
Processing	<i>Analysing</i>	Effective case/s made for meeting criteria, supported by organized and relevant data.	Case/s made for meeting criteria supported by data.	Description of features of the data	<i>The work submitted has not met the</i>
	<i>Designing</i>	Original toy design that integrates the practical and aesthetic demands in the design requirements.	Appropriate toy design that meets the practical and aesthetic demands in the design requirements.	A toy design that meets the practical demands of the design requirements.	<i>acceptable standard described for</i>
Self and Others	<i>Working in teams</i>	Significant and collaborative contribution to the design and making of the toy across the project.	Significant and cooperative contribution to the design and making of the toy.	Identifiable contribution to the design and making of the toy	<i>this criterion.</i>