Mathematics Short Term Plan Year 5 Term 1 Week 6 Unit - Shape and Space

Children exceeding MARE	Children at MARE	Children just below MARE	Children well below MARE
7 children – Levels 4c/4b	**11 children – Levels 3b/3a**	**4 children – Level 3c**	**4 children – Level 2b/2a**

This week's groupings:

Strawberry (6)	Banana (6)	Apple (4)	Orange (4)	Cherry (8)
MF KW QP EH DE	KP ZW JE AP MS	FE RQ AH LR	EH EP JM JF	OP JV AH CD HA SS JP
Work on test access with target children (M). Higher, Extend, Consolidate, Support				

Week Beginning:	8th October 2012		**Strand:**	Shape, Space and Measures
Mental/oral Objective/focus:	Derive and recall multiplication facts for the 2, 3, 4, 5, 6 and 10 times-tables and the corresponding division facts. (C Level 3)	**Key Objectives:**	Relate 2D shapes and 3D solids to drawings of them and describe, visualise, classify, draw and make the shapes. (SSM Level 3) Classify 3-D and 2-D shapes in various ways using mathematical properties such as reflective symmetry for 2-D shapes. (SSM 4) Draw polygons and classify them by identifying their properties, including their line of symmetry. (SSM Level 3) Complete patterns with up to two lines of symmetry and draw the position of a shape after a reflection or translation. (SSM Level 4) **PROBLEM SOLVING:** Level 3: Begin to organise their work and check results. Level 4: Present information and results in a clear and organised way.	
Layered Target	**MUST:** Derive and recall multiplication facts for the 2, 3, 4, 5, 6 and 10 times-tables and the corresponding division facts. (C Level 3)	**SHOULD:** Derive and recall multiplication facts up to 10 x 10, the corresponding division facts and multiples of numbers to 10 up to the tenth multiple. (C Level 4)	**COULD:** Derive and recall multiplication facts up to 12 x 12, the corresponding division facts and multiples of numbers to 12 up to the twelfth multiple. (C Level 4/5)	
Homework set: Friday, 12/10/12	**Lower:** Mathematics Homework and Assessment, Year 5, page 5, Autumn	**Middle:** KS2 Mental Maths Workout, Year 5, page 4	**Higher:** KS2 Mental Maths Workout, Year 6, page 4	**Due in: Thursday, 18/10/12**

M	**Mental/Oral LO:**	**Main LO:**			**Plenary**
		AA	**A**.	**BA**	
		Vocabulary			
	Activity	No Maths – Year 5 on trip.			

T	**Mental Oral LO** Know and use mathematical vocabulary.	**Main LO** **AA** WALT classify 2d and 3d shapes according to their properties.	**A** WALT classify 2d and 3d shapes according to their properties.	**BA** WALT classify 2d shapes.	**Plenary**
		Vocabulary square, rectangle, right-angled triangle, hexagon, pentagon, circle, cube, cuboid, parallel, perpendicular, vertex, edge, face, side, symmetry, angle			
	Activity Have scrambled up key words on the IWB. Can they unscramble them and explain what each of them means?	**AA/A – Teach/Practise - Teacher** Look at photographs and identify different shapes (2d and 3d). Link up to vocabulary from previous activity. Go around the school grounds to find examples for each of the words. Take photographs and indicate on "Shape spotter" sheet, what has been found and where.	**AA - Practise** Shape spotter sheet 3 (includes parallel and perpendicular lines) **A – Practise** Shape spotter sheet 2 (includes specified triangles and a greater range of 2d shapes). Use a camera to take pictures of examples. These can later be added to the Wanted posters, if required, and used as a reference point throughout the unit.	**AA/A – Apply – Independent** Pupils pick one of the shapes and create a "Wanted" card about it. They have to include its name, whether it is a 2d or 3d shape, number of vertices + edges, sides/faces, symmetry, angles, etc. Add as much as possible, then complete throughout the unit.	Use post-its and have pupils go around the room. They should leave a post-it with the location of a shape, if they can remember where it was spotted earlier in the lesson.
		BA – Teach/Practise/Apply – LSA *Teach:* Look at laminated photographs and identify different shapes. Establish meaning of key vocabulary and label. (See list.) *Practise:* Use small elastic bands. Ask pupils to create the outline of different shapes with the elastic band. Once confident, ask them to challenge each other to make certain shapes. Discuss properties of shapes as they go on (number of sides, vertices, right angle, straight/curved lines, etc.)			

		Apply: Go outside/hall to make different shapes. Use large elastic bands and challenge pupils to create the outline of different 2d shapes.	

W No Pens	**Mental Oral LO** Begin to visualise 3d shapes.	**Main LO**			**Plenary**
		AA WALT visualise and create 3D shapes from drawings.	**A** WALT visualise and create 3D shapes from drawings.	**BA** WALT visualise and create 3D shapes from drawings.	
		Vocabulary 3d, 2d, visualise, solid, names of 2d and 3d shapes, vertex/vertices, edge, face, regular, irregular			

	Activity Begin by explaining to the children that their challenge is to visualise 3D shapes from drawings and to be able to do this they will need to remind themselves about 3D shape names and their properties. Give the children a container of 3D shapes and a set of cards with the shape names and ask them to match the correct shape and card. The children will need to do this activity as part of a group and will need to discuss how they know which ones match and their properties. This task needs to be fast-paced. It is important to allow the children the opportunity to explain their choices with their reasoning, possibly one child with one shape from each group. http://www.bgfl.org/custom/resources_ftp/client_ftp/ks2/maths/3d/index.htm	**AA/A – Teach – Teacher** *Stage 1 (Comprehension):* Show the children drawings of 3 different 3D shapes and have one of the shapes to model to the children in your hand. Ask the children which drawing the model matches. Give the children the opportunity to visualise each drawing in their head and then discuss their thoughts with their reasons with a learning partner. Discuss the children's choice and ask them to explain why it couldn't possibly be any of the other shapes on the board. At this stage children should be using mathematical vocabulary to discuss the properties e.g. vertices, edges and faces. *Stage 2 (Simplified Application):* Show the children an example of a 3D shape you have created using play-doh and drinking straws; explain that they will need to do the same using the drawings you have provided.	**AA/A – Practise/Apply – Independent** *Stage 3 (Extended Application):* Individually or in pairs, the children create their chosen shapes, discussing what they are doing with their partners. **AA** (Strawberry and Apple): Work independently, using a greater range of shapes to create. Start to look at more complex shapes. Use "Skeleton Shapes" as activity focus: http://nrich.maths.org/1156 They should decide first, which number of straws and play-doh balls they will need and then create the shape. Once finished, take a photograph of the skeleton shape. **A** (Banana and Orange): Work in pairs to create their own skeleton models of different shapes. Use shape pictures to work from. Once they have finished a model, take a picture. Check whether they can create models with the lowest number of play-doh corners and straws possible.	*Stage 4 (Evaluation):* Ask the children to come together as a class. Select a child to hide their shape behind a whiteboard and describe its properties to another child; this child then has to guess the name of the shape. This can be repeated a number of times. It is important to hide the shape carefully each time so no clues are given away.
		BA – Teach/Practise/Apply – LSA *Teach:* Show the children drawings of 3 different 3D shapes and have one of the shapes to model to the children in your hand. Ask the children which drawing the model matches. Give the children the opportunity to visualise each drawing in their head and then discuss their thoughts with their reasons with a learning partner. Discuss the children's choice and ask them to explain why it couldn't possibly be any of the other shapes on the board. At this stage children should be using mathematical vocabulary to discuss the properties e.g. vertices, edges and faces.		

		Practise: Show the children an example of a 3D shape you have created using play-doh and drinking straws; explain that they will need to do the same using the drawings you have provided. *Apply:* In pairs, the children create their chosen shapes, discussing what they are doing with their partners.	

<table>
<tr><td rowspan="2"></td><td rowspan="2">Mental Oral LO
Assess information for validity and usefulness. Begin to think carefully about mathematical approaches.</td><td colspan="3">Main LO</td><td rowspan="2">Plenary</td></tr>
<tr><td>AA
WALT develop an understanding of what information is necessary to solve the problem and to make the link between symbolic and numerical representation of the solution.</td><td>A
WALT present our work in a clear and organised way and explain clearly why certain solutions adhere to the given criteria.</td><td>BA
WALT check our work for correct application of the rules and used symbols to represent our work.</td></tr>
<tr><td></td><td colspan="3">Vocabulary
Even number, systematically, organise, investigate, finding all possibilities, record</td><td></td></tr>
</table>

TH	Activity Have "The Captain's Question" on the IWB. Ask children to come up with suggestions on how to find the age of the captain. Establish that in order to calculate an answer, certain information needs to be given and that questions/tasks need to be read carefully. In this case, the information provided is insufficient and does not offer a solution to the question.	***Problem Solving Focus Lesson*** **AA/A/BA - Teach – Teacher** *Stage 1 (Comprehension):* Present the task to pupils on the IWB. They will have to find all of the possibilities. Pupils should be using highlighters to mark all of the information within the rules that they think they need to solve this problem. Support pupils in considering the text and breaking the problem up into its essentials. Feed back to class and talk about what information is needed and why. Highlight information on IWB. *Stage 2 (Simplified Application):* Take pupils to Year 5 area to go through the task. Move pupils into different pens to represent the problem. Refer back to rules and consider possibilities and wrong movements. Discuss how to proceed after the first option is found. Pupils should begin to consider a systematic approach, concentrating on one move at a time.	**AA/A/BA - Practise/Application - Independent** Pupils have five minutes to work out as many possibilities for arranging the sheep when 2 sheep are in the smallest pen (4 possibilities). *Strategy check* – Are they working systematically? Look at images and determine why some of the layouts are systematic, while others aren't. Reinforce the need for an organised method to be used. *Stage 3 (Extended Application):* Give pupils the opportunity to find as many possibilities as possible. In total, there should be 7 possibilities. *Stage 3b (Synthesis) Extension:* Ask pupils to consider their system for recording. Would it still be viable, if the number of sheep involved were bigger? How can it be changed? Pupils will be asked to work on a similar problem, developing their understanding of systematic representation of information further. The problem presented is more complex, requiring pupils to check carefully and to organise their work with care. Differentiation: Differentiation is mainly organised by outcome and support. The task is open-ended and allows pupils to work at their own pace, achieving objectives in relation to their target levels and above. Mixed-ability grouping has been used on purpose, to provide pupils with a safe working environment, in which they are confident to make and revise mistakes, voice opinions and share ideas, and is also used to support weaker pupils with a partner. As in other lessons, pupils are given information on the difficulty of tasks in relation to their target and therefore have the opportunity to self-direct their learning and progress. - Modelling for the whole class is included, to support pupils in visualising the problem at hand. - The tasks are given in stages, offering the pupils the opportunity to reflect and if necessary to adapt their work. - The task is open-ended. Not all pupils will find all possibilities. - The use of resources is provided to support pupils, while others will be able to work with numbers alone. There is no LSA support available in this lesson.	*Stage 4 (Evaluation):* Have possible answers to the sheep problem on the board. Start with one answer only, allowing pupils to evaluate the answer, looking only at the written representation. Does it meet all the criteria? Why? Why not? Extend to multiple answers with mistakes.

<table>
<tr><td></td><td>Mental Oral LO
Know and use mathematical vocabulary. Justify and explain their answers and ideas.</td><td colspan="3">Main LO
AA
WALT identify line and rotational symmetry.

A
WALT identify line symmetry.

BA
WALT complete patterns with one line of symmetry.

Vocabulary</td><td>Plenary</td></tr>
<tr><td>F</td><td>Activity
Use symmetrical patterns on the IWB, asking pupils for thumbs up/down to say whether they are symmetrical. Move from simple to more complex patterns. Check for correct understanding of vocabulary.</td><td rowspan="2">Teach – Teacher
Stage 1 (Comprehension):
Gather group around one table and show them how to use tracing paper to check symmetry of shapes. Discuss how to find the lines of symmetry of a shape and the importance of finding all the possibilities. (Link to previous PS activity)</td><td>AA – Teach/Extend – Teacher
Look more closely at rotational symmetry. Talk through how to use the tracing paper to find the order of rotational symmetry. How many times can the shape fit in?</td><td>AA – Practise/Apply - Independent
Stage 3 (Extended Application):
Use tracing paper to check line symmetry and rotational symmetry of different 2d shapes. Record answers in a table. Look at different triangles, quadrilaterals and polygons.</td><td rowspan="3">Stage 4 (Evaluation):

Discuss the outcome of their shape investigation. Were they able to spot a pattern when looking at symmetry, particularly with different polygons?

Ask Cherry to share their mandalas and explain how they work. How can we check for symmetry?</td></tr>
<tr><td colspan="2">A – Practise/Apply – Independent
Stage 2 (Simplified Application):
Use tracing paper to check symmetry of different 2d shapes. Record answers in a table. Look at different triangles, quadrilaterals and polygons.</td></tr>
<tr><td colspan="3">BA – Teach/Practise/Apply - LSA
Teach: Look at examples of symmetric patterns. Talk through folding process of paper and using mirrors to help.
Practise: Complete symmetric patterns independently.
Apply: Ask pupils to complete mandalas, using symmetry. They need to have at least one line of symmetry, two if possible.</td></tr>
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Within in each Maths lesson there will be a Mental Oral starter linked to main teaching session if possible
During the main body of the lesson you must plan for each group to receive

- **Teach** – teach the new skill / concept / method. To include modelling and shared example
- **Practise** – the skill / concept / method independently (of the teacher) in the same context as it was modelled
- **Apply** – the new skill / concept / method in a different context. This is the problem solving element