Build Scott Base Maths
- Level 3 -
Area and Perimeter / 3D shapes

Mathematics Standards - by the end of Year 6:

- sort two- and three-dimensional shapes (including prisms), considering given properties simultaneously and justifying the decisions made;

- represent and describe the results of reflection, rotation, and translation on shapes or patterns;
  • identify nets for rectangular prisms;
  • draw or make objects, given their plan, front and side views;

WALTs from Team Solutions:

1. Define, name, describe and draw 2D (plane shapes) and 3D shapes (prisms) by their spatial features:
   2D shapes/plane shapes:
     - Sides, Corners, Angles, Diagonals, Perimetre, Centre
   3D shapes/prisms:
     - Faces, Edges, Corners, Angles, Vertices (vertex), Surfaces
2. Draw nets for simple 3D shapes and make models (with equipment and paper) using the nets *Note: By the end of year 6 students must be able to identify whether or not a net will fold to make a given cuboid model, e.g. which one of these nets will make a cuboid?*
3. Enlarge (on grid paper), simple shapes to a specified scale e.g. twice the size, three times the size
4. Describe the transformations of an object (e.g. reflection, rotation, translation, enlargement)
5. Design and make patterns that involve translation, reflection and rotation
6. Solve measurement problems by using a range of calculation strategies (area and perimeter)
   E.g. The perimeter of the classroom is 10m + 10m + 7m + 7m =34m
   Or 2x10 + 2x7 = 20 + 14 = 34

TERM 4 MATHS PROJECT

Antarctica New Zealand

DESIGN A NEW SCOTT BASE IN ANTARCTICA

It needs to have:
- Enough rooms to sleep 100
- A kitchen
- The Mess - feeding 100 people at a time
- Toilet/bathroom facilities
- Laundry
- Library
- Medical Room
- Gym
- AFT gear room
- Engineers Workshop
- Vehicle workshop
- Admin office
- Communication office
- Reverse osmosis room
- Science lab
- Locker Room

Things to consider:
- How big should a bedroom be?
- How many people would sleep in each room?
- Can you seat everyone in the dining room (The Mess)?
- How many people could use the Medical Room at a time?
- Snow! - think about snow loading
- Ice! - how does ice affect some building materials?

Your design must be at a scale of -
- 1 square of your maths book : _____ m
- Your building/s must be approx 1500m^2 in total
- The total perimeter of the base should be no larger than 350m

There must be some symmetry / rotation / reflection / translation in the design

You will present you design in either:
- a scale plan on grid paper. You may draw in plan, in different perspectives, or just one view.
- or create a scale model plan of your design using 3D shapes.
- This could be in Minecraft - 1 block = 1m

POSSIBLE TEACHING SEQUENCE / WORKSHOPS	
Teaching Sequence:	**Explicit teaching of WALT Workshops:**
1. Look at current Scott Base	
2. Look at new design of Scott Base	
3. Read above brief of what your base must have 4. Investigate any elements you do not know; eg The mess, osmosis plant	

5. Designing:
    a. discuss loading of snow and ice
    b. 3D shapes that will work in the environment
    c. Reflection, rotation, transformation
    d. How to draw in perspective
	● 3D shapes - nets
	● Loading
	● Reflection, rotation, translation (Mathletics bk Space, Shape & Position pdf & Geometry L3 AWS pdf)
	● Perspective drawings

6. Once designed: Make adjustments to fit -
    a. Area and perimeter - make sure it fits the brief
    b. What a scale is
	● Area
	● Perimeter
	● scale

7. Presentation - this could be in a:
    ● 3D model
    ● Perspective drawing
    ● Minecraft /lego design	