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| **Perfect Plans** |
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| How to Draw a Plan View |
| **Subject(s):** D&T, Mathematics**Approx time:** 40 – 60 minutes |  | **Key words / Topics:** * Drawing
* Ruler
* Scale
* Plan view
* Proportion
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| **Suggested Learning Outcomes**  |  |  |
| * To understand the purpose of a plan view drawing.
* To be able to create a plan view drawing.
* To be able to use dimensions and scale when drawing.
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| **Introduction** |  |  |
| This is one of a set of resources developed to support the teaching of the primary national curriculum. They are designed to support the delivery of key topics within design and technology and maths. This resource focusses on drawing a plan view of a classroom.Different types of drawing are used to communicate different types of information. Plan views see a section of an object as projected on a horizontal plane. In effect, a plan view is a 2D section drawing viewed from the top – this is different from a top view, which would see all of the features looking down from above. In the case of a room, for example, a plan view may show table tops, chairs, doors etc., whereas a top view would also show the legs of the tables, light fittings etc.Plan views are widely used to show rooms or buildings from above. They may include measurements, furniture, appliances, or anything else necessary to the purpose of the plan. Plan views may be used to see how furniture will fit in a room, for example when designing a new kitchen, to show the builders the layout of a new building, or on estate agent’s literature to give potential buyers an indication of what a house is like.Producing a plan view develops drawing skills, whilst simultaneously allowing concepts such as dimensions, proportion and scale to be introduced in a practical context. |
| **Purpose of this activity**In this activity learners will produce a plan view drawing of their classroom, working in proportion and ideally to scale. This could be used as a one-off activity, an extension to maths learning on scale, or linked to other school activities, such as preparing a map for parents evening. |
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| **Activity** |  | **Teacher notes** |
| **1. Introduction to the activity (10-15 mins)**Teacher to present an example of a plan view and explain what this type of drawing is used for. Teacher to describe how a plan view drawing of a classroom is produced using the presentation. If necessary, remind (or explain to) learners what is mean by scale.**2. Drawing a classroom (25 - 35 minutes)**Learners to produce a plan view drawing of their classroom:1. Draw the outline of the classroom, including any doors or exits.
2. Choose one feature in the room – draw this in the correct place.
3. Draw in the next feature...
4. … then keep adding the other features...
5. … until all the features of the classroom are shown on the drawing.
6. Finally, label all the features

**3. Review of completed drawings (5 – 10 minutes)**Share selected drawings with the class – for each, identify three features or characteristics that have been done well, and one improvement that could be made |  | This activity should be completed as individuals, although measurements, if carried out, could be made by teams.**Introduction to the activity**Emphasise that the parts are shown in proportion to each other, to scale.As an alternative to using the presentation, the teacher could demonstrate how to produce a plan view drawing. **Drawing a classroom** Learners could be advised of the dimensions of the room and features or measure these themselves using tape measures. Additional time should be allowed if learners are to carry out the measurements.The outline of the classroom could show just the inner face of the wall or could be a ‘double line’ representing the thickness of the wall. The drawings produced should have all features in the correct proportion to each other and ideally to an appropriate scale. If squared paper is used, the size represented by each square could be advised. It can help to draw based on distances from a specific reference point, such as the top left corner on the drawing or the first feature drawn. The first feature could be drawn relative to the walls, with the second feature relative to the first feature, the third feature relative to the second feature and so on; however, this risks errors due to a ‘tolerance stack-up’, where later items become increasingly out of place relative to the walls.**Review of completed drawings**If a USB camera is available, this could be connected to the computer attached to the projector, allowing the drawings to be displayed on the whiteboard/projection surface. [A simple frame to support the camera can be made using rigid wire (for example, cut from two metal coat hangers), bent so it sits over the drawings.] |
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| **Differentiation** |  |  |
| **Basic** |  | **Extension** |
| Provide a template showing the outline of the classroom.Advise the size to be represented by each square on the paper.List the sizes (maximum length and width) of each of the items of equipment in the room. |  | Measure the dimensions of the room and the equipment within it, using appropriate equipment.Produce the drawing to a specified scale.Produce the drawing on plain (non-squared) paper.Produce a plan view of the school building, which could be used as a map by visitors (such as parents visiting for an open evening).Use CAD software to produce a plan view on a computer. |
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| **Resources** |  | **Required files** icon-docicon-pdficon-ppt |
| **Tools and resources:*** Example of a plan view drawing
* Pencils
* Rulers
* Squared paper
* Optional: other measuring equipment, such as tape measures, if available.
 |  | icon-ppt Teacher presentation – Perfect Plans |
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| **Additional websites** |  |  |
| * **Technology Student – Architectural drawings:** an example of a plan view of a house <http://www.technologystudent.com/designpro/archi1.htm>.
* **Plan views of different types off class room:** from the Eire Department for Education and Skills: <https://www.education.ie/en/School-Design/Design-Guidance/Room-Layouts.html>.
* **Examples of plan view drawings:** <https://www.smartdraw.com/floor-plan/examples/>.
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| **Related activities (to build a full lesson)** |  |  |
| **Starters** (Options) * Show examples of different types of drawing and ask their purpose (e.g. a plan view to show where to put furniture in a room, an exploded view to help assembly, an isometric drawing to show what a product looks like, a section drawing to show how the parts in a product fit together, an orthographic drawing to show dimensions etc.).
* Use IET Education Primary Poster – Section Drawings to introduce section drawings and their uses.
 | **Extension** (Options)* Produce the drawing to a specified scale.
* Produce a plan view of the school building, which could be used as a map by visitors.

**Plenary*** Share selected drawings with the class – for each, identify three features or characteristics that have been done well, and one improvement that could be made
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| **The Engineering Context** film |
| Designers and engineers need to be able to communicate the details and features of products to other engineers, manufacturers and users. This can include sizes, assembly instructions and layouts. Drawings are typically one of the main methods used for this communication – they can be found in every area of engineering and manufacturing.  |

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| **Curriculum links**  |
| **England: National Curriculum**Design and Technology* KS2: 1b, 3a

Mathematics (extension activity)KS2 Measurement* measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
* convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
* solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate

KS2 Number – multiplication and division:* solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

KS2 Geometry - Properties of shapes* draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them

KS2 Ratio and proportion* solve problems involving similar shapes where the scale factor is known or can be found
 | **Northern Ireland Curriculum**KS2 Art and designEngage with observing, investigating, and responding to first hand experiences, memory and imagination:* look at a range of natural and man-made objects, exploring and investigating the characteristics of what is seen by close observation, touch and recording. Discuss what has been seen and handled
* Visualise, describe and sketch objects, environments, places and entities

Use a range of media, materials, tools and processes such as: drawing, painting, printmaking, malleable materials, textiles and three-dimensional construction, selecting which is appropriate in order to realise personal ideas and intentions:* make drawings, paintings and three-dimensional objects using a range of techniques and approaches
* work using a broad range of sizes and scales, and on a variety of supports, selecting the format appropriate to intentions

MathematicsKS2 Measures* develop skills in estimation of length, weight, volume/capacity, time, area and temperature
* appreciate important ideas about measurement including the continuous nature of measurement and the need for appropriate accuracy
* understand and use scale in the context of simple maps and drawings

KS2 Shape and space* construct a range of regular and irregular 2-D shapes, classify these through examination of angles and sides, recognise line and rotational symmetry, reflect shapes in a line, explore tessellations, name and describe common 2-D shapes, begin to understand congruence in 2-D shapes
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| **Scotland: Curriculum for Excellence**Technologies* TCH 2-11a

Maths (extension activity)* MNU 2-11b, MTH 2-17d
 | **Wales: National Curriculum** Design and Technology* KS2 Designing: 2, 5

Mathematics:KS2 Developing numerical reasoning* Identify processes and connections - estimate and visualise size when measuring and use the correct units
* Represent and communicate - select and construct appropriate charts, diagrams and graphs with suitable scales

KS2 Using number skills* Fractions, decimals, percentages and ratios - use simple ratio and proportion

KS2 Using measuring skills* read and interpret scales or divisions on a range of measuring instruments
* make estimates of length, weight/mass and capacity based on knowledge of the size of real-life objects, recognising the appropriateness of units in different contexts
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| **Assessment opportunities** |
| * Teacher assessment of the completed drawings
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