



Mathematics lesson 1 – Teacher notes

Lesson 1 – Teacher notes

Learning aim:

To begin determining a suitable office space for a modern company.

Curriculum links and Skills Builder focus skills chart:

England The national curriculum	Geometry and measures Pupils should be taught to calculate surface areas and volumes of spheres, pyramids, cones and composite solids.
Scotland National 5 Mathematics	Geometric skills Calculating the volume of a standard solid (sphere, cone, pyramid) and calculating the area of a sector.
Wales WJEC GCSE mathematics specification	Geometry and measure Calculate the surface area, cross-sectional area and volume of cubes, cuboids, prisms, cylinders and composite solids.
Skills Builder Framework Focus Skills	
Aiming high – The ability to set clear, tangible goals and devise a robust route to achieving them	Aiming high step 4 I work with a positive approach to new challenges.
Teamwork – Working cooperatively with others towards achieving a shared goal	Teamwork step 3 I work well with others by taking responsibility for completing my tasks.

Main skills developed and how:

- Interpretation – Students will work out compound areas to be able to solve problems in context.
- Calculation – Students will calculate compound area, including sectors and apply best buy problem solving skills.

Equipment required:

- Calculators
- PowerPoint
- Student worksheet
- Answer sheet

Suggested layout of the session:

2 minutes – Go through the aims and main skills addressed in the lesson. Then discuss with students the context for the session. Modern working life is changing – with many employees now working between home and the office. Now employees have the freedom to choose their workplace and working hours, they typically visit the office to attend face-to-face meetings and socialise with colleagues. Consequently, companies no longer require large office space. Many are downsizing and looking for exciting, dynamic workspaces to inspire their staff. Look at some pictures of the two office providers, InnovateSpace and WorkTogether, that the Interior Designer choosing from.

An Interior Designer is working with an e-learning company, called LearnE, who have 700 staff and are looking to find a suitable office to downsize to.

4 minutes – It is anticipated that LearnE staff will only go into the office for 2 days a week. Complete activity 1, the warmup, to work out the minimum number of staff in a day. (This can be done in pairs or individually.) This may need some modelling with different numbers to show them how to calculate this.

For question 2, you may discuss what is assumed by the calculation, for example the calculation assumes that staff come into the office in a consistently smooth way, i.e., they all take their two days in such a way that it is always 280 each day, never all 700 on say a Monday. You may also discuss what this might mean for the company and how they manage it, for example, either asking people to only come in on those specific days or have a space that allows for more than 280 people to be in at once.

8 minutes – Using the PowerPoint and student worksheet, explain the table – which details how much space is required, for how many workers and the allocated cost. This is called ‘workplace details’ and the costs and required measurements per person are the same for InnovateSpace and WorkTogether. Then allow students to work their way through the calculations for InnovateSpace and for WorkTogether where they are asked to work out compound areas, and decide how many staff can fit in each space, and the associated cost.

Communicate to students that if there is only one measurement shown in the white space, assume that the shape is a square.

5 minutes – Quickly run through the answers for both of the spaces, and then split groups into either InnovateSpace or WorkTogether.

Interior designers will often have to find the opportunities in spaces and argue the case for them. In their groups, students will have an opportunity to make the case for one of the office spaces and state why LearnE should consider the space.

4 minutes – Allow two groups (one InnovateSpace and one WorkTogether) to make their case for the space. In their answers, they should include:

- A proposal for the office space.
- How the office space will change the way staff currently work.

- Why your plan will be beneficial to the company LearnE and their employees e.g.,
 - Larger floor space means more flexibility for when staff can come in.
 - Larger spaces tend to have lower cost per person.
 - Overall cost is lower with smaller space.
 - Some spaces, e.g., triangular spaces, might be awkward or exciting to work in.
- Any relevant calculations or comments about the shape and size of the rooms available.

2 minutes – Ask students to complete reflection part 1 and 2 in silence.

Ways to differentiate:

- Scaffold the tasks where needed, modelling on the board to allow students to develop metacognitive thinking.
- Prior to starting, recap area formula.

