You can use the following methodology to calculate the capacity of rooms in your school, based upon fire safety standards. The method involves two separate calculations:

1. The total usable area of the room divided by the occupancy factor. (The use to which the room is to be put)

2. The number, size and location of the available exits.

The tables below have been designed to enable you to work through the calculations and decide upon the maximum capacity. You will also find some worked examples, to demonstrate how the method is applied.

If you have any queries at all, please feel free to contact SafetyMARK on 0845 873 2390 or info@inhousesafety.co.uk.
<table>
<thead>
<tr>
<th>Room/Area</th>
<th>Occupant capacity factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly Hall/Dual purpose area</td>
<td>0.45</td>
</tr>
<tr>
<td>Persons Standing, seated without chairs.</td>
<td></td>
</tr>
<tr>
<td>Assembly Hall/Dual purpose area</td>
<td>1.0</td>
</tr>
<tr>
<td>Persons seated (chairs in rows)</td>
<td></td>
</tr>
<tr>
<td>Hall used as examinations room</td>
<td>1.25 metres between chair centres, 750mm aisle width between desk edges</td>
</tr>
<tr>
<td>Desk and chair per person</td>
<td></td>
</tr>
<tr>
<td>Dining Room, Restaurant</td>
<td>*1.0 to 1.5</td>
</tr>
<tr>
<td>Sports Hall (not used for assembly or</td>
<td>5.0</td>
</tr>
<tr>
<td>examinations etc)</td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td>6.0</td>
</tr>
<tr>
<td>Staff Common Room</td>
<td>1.0</td>
</tr>
</tbody>
</table>

* Depending upon minimum aisle space of 0.8 M for movement and escape
Table 2  Number of fire exits needed

<table>
<thead>
<tr>
<th>Maximum number of persons</th>
<th>Minimum number of escape routes/ exits</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>1</td>
</tr>
<tr>
<td>600</td>
<td>2</td>
</tr>
<tr>
<td>More than 600</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 3  Exit door widths

<table>
<thead>
<tr>
<th>Minimum width of doors on escape route (stated in mm)</th>
<th>Maximum number of persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>750*</td>
<td>100</td>
</tr>
<tr>
<td>850</td>
<td>120</td>
</tr>
<tr>
<td>1050</td>
<td>200</td>
</tr>
<tr>
<td>Additional 75mm increases capacity by 15 persons (or part thereof) e.g. 1200 mm 1500 mm 1800 mm</td>
<td>230 290 350</td>
</tr>
</tbody>
</table>


* 750mm is the minimum width of an escape route or door.
Calculating Exit Capacity

When calculating the overall capacity, if a room has two or more exits it has to be assumed that a fire will prevent the occupants from using one of them.

The remaining useable exit(s) need to be wide enough to allow all occupants to leave quickly. Therefore, when deciding upon the total available exit capacity the largest exit from the room must be discounted.

- If only one exit is available from a room then the maximum capacity is 60 persons regardless of the width of the exit.
- An exit consisting of a double-door is regarded as one exit.
- If escape route doors are too close to one another and are likely to be simultaneously disabled by the same fire (e.g. within 45° of each other) then they should be classed as one exit and it may be necessary to discount them both from your calculation.
- Escape routes that may be classed as ‘true alternatives’ should therefore be more than 45° apart when viewed from the furthest point in the room. (see Diagram 1 at the end of this document).
- A number of exits which discharge into a common area cannot be regarded as alternative to each other.

The two calculations, occupancy factor and available exit capacity should be undertaken and the calculation which arrives at the lowest number, is the maximum permitted capacity.
Worked Example 1

A school hall with a usable area of 210 $M^2$, being used as an assembly hall (all standing or seated without chairs) would have a maximum calculated capacity of :-

**Total occupancy capacity**

$\frac{210}{0.45} = 466$ people *using occupancy capacity factor from Table 1*

**Total exit capacity**

For > 60 people to be able to use the area a minimum of 2 exit routes are required (once the widest exit has been excluded).

The hall has 2 sets of double doors and 1 single door all at more than 45° apart

- $1@2.1M$
- $1@1.8M$
- $1@0.75M$

The widest exit route must now be excluded from all subsequent calculations.

This leaves

- 1 Door at 1.8M with a capacity of 350 people
- 1 Door at 0.75M with a capacity of 100 people  *(from table 2)*

**Therefore, total exit capacity is 350 + 100 = 450 people**

Each of the remaining exit routes must be true alternatives at more than 45° apart. Final exits must be marked as fire exits.

**Therefore, the maximum number of persons allowed in the hall equals the lowest calculated figure, which is 450.**
Worked Example 2

Seated persons take up far more space than people standing. If people are seated at tables, the occupancy factor is reduced further.

Should the same hall as in Example 1 be set out for a production and chairs are used, then the calculation should be carried out as follows:

**Total occupancy capacity**

\[
\frac{210}{1.0} = 210 \text{ people (using occupancy capacity factor from Table 1)}
\]

**Total exit capacity**

\[
350 + 100 = 450 \text{ people (as previously calculated)}
\]

In this case the maximum number of persons that can be accommodated in the hall is 210 persons, this being the lowest calculated figure.

**Layout and Gangways:** [See diagram 2] at the rear of this document.

As far as practicable, seating should be in regular blocks, having gangways of uniform width.

- Gangways: at least 1100mm wide
- Not more than 14 seats in a row with a gangway each end Or, not more than 7 in a row with a gangway at one end
- Space between rows; at least 300mm
- Seatback to seatback measurements between seats at least 740mm; or 600mm in bench seats with no backs (See diagram 2)

You also need to be aware of any specific licensing requirements and adhere to any capacity limits set by this.
Worked Example 3

People standing / seated without chairs

From Table 1:
$$165M^2 / 0.45 = 366 \text{ persons}$$

From Table 2:
2 exit routes required if over 60 people are to occupy the hall, in this example 3 routes are available. (However exits 2 and 3 are within 45 degrees, see diagram 1, and discharge into a common area and thus must be regarded as one exit)

Should a fire occur as in this example both exits 2 and 3 would be disabled. Exit 1 is the only available exit therefore the total capacity is based upon the exit width of this door, in this instance Exit 1 = 1500mm thus, from Table 3, 290 persons is the maximum capacity of the hall.

People seated chairs in rows

From Table 1:
$$165M^2 / 1 = 165 \text{ persons}$$
Since the maximum number is taken from the calculation which arrives at the lowest number in this instance the maximum capacity is 165.
Diagram 1

Doors may be counted as 2 separate exits

45° OR MORE

Doors must be counted as one exit

Less than 45°