



## Activity description

This is a simulation of a booking system for a small guesthouse.

Pupils have to manage the bookings and, as far as possible, arrange to give people the accommodation they request.

## Suitability

Pupils working at lower levels in pairs

## Time

Up to 2 hours

## AMP resources

Pupil stimulus and booking sheets

Room plans and booking requests

Booking enquiries log and receptionist notes

## Equipment

Access to computer spreadsheet

## Key mathematical language

Scheduling, logic, decision making

## Key processes

**Representing** Finding and using alternative ways to handle a large amount of information; identifying factors that affect how bookings can be managed.

**Analysing** Working efficiently and systematically towards producing a clear plan, assigning guests to rooms while taking constraints into account.

**Interpreting and evaluating** Adapting solutions to take account of additional new constraints.

**Communicating** Producing a clear, accurate booking sheet; providing guests with clear reasons when requests cannot be met.

Beach guesthouse

**Beach Guesthouse**  
Crest Road  
Seascape  
Devon EX91 WUJ

Friday morning 8 a.m.  
June 5th

FOR THE NEW RECEPTIONIST

I'll be busy this morning.  
Could you make out next week's booking sheet?  
Do it in pencil in case we have to make changes later.  
Show me when you've finished.

Mrs Penhagyon

NEXT WEEK

- ① The Allens are in room 3—they're staying on till Thursday 11th, so their last night will be the 10th.
- ② Mr. George will be in Room 5. He will be leaving on Wednesday 10th.
- ③ The Rogers and the Peters will be leaving on Monday. So they don't appear on next week's sheet.

PS Also enclosed are some bookings from ages ago. Could you please put them on the booking sheet? Make sure they get suitable rooms. The plans show what each room is like.

Nuffield Applying Mathematical Processes (AMP) Practical exploration 'Beach guesthouse'  
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## Teacher guidance

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This activity uses a large number of pieces of information; these need to be dealt with systematically, in order. Classroom organisation will need to be considered carefully so that pupils can access the resources easily when required.

The initial booking requests are given on the pupil stimulus dated 5th June. Three further booking requests are all dated before 5th June. The booking enquiries log contains further booking requests, not all of which have been added to the booking sheet. Eight further booking requests, by letter, email or telephone message are all dated 5th June and marked with time received; these bookings are to be made in time order.

Pupils may wish to record bookings electronically. A simple spreadsheet is provided or pupils can create their own.

Telephone calls are presented as written messages. Teachers may wish to present this information orally, with pre-recorded messages (on CD or computer) or by role-playing guests ringing with enquiries.

Imagine that you and your friend have gone on holiday to Devon. You have been staying in a caravan, and it's nearly time to go home. You don't want to go home yet, but you've run out of money so you haven't any choice. Then you have a piece of luck because you hear that there are temporary jobs going at the Beach Guesthouse.

You go along to Mrs Penhaligon who runs the Beach Guesthouse, and she says she'll take you on if you can start in the morning.

In the morning you go round early. Mrs Penhaligon is very busy because she's cooking breakfast for the guests, so she tells you to go to the reception desk where you'll find the booking sheet, a note asking you to fill in next week's sheet and three old booking requests.

Bookings come in by letter, by phone and by email. When you've filled in the sheet, let Mrs Penhaligon know and she'll give you the next booking requests.

You can be operating as Mrs Penhaligon and providing pupils with information as and when necessary. Some pupils might be able to organise themselves and obtain all the information at the start. Most will benefit from being given the information stage by stage. The planned sequence is as follows:

Give out the note timed 8am and the booking sheets; pupils add the Allens and Mr George to the booking form.

Give out the room plan and the three previous bookings; pupils add these requests to the booking form.

Give out the booking log sheet; pupils check these details against the booking form.

Give out the eight further booking requests; pupils complete the booking log and add new bookings to the booking form.

You may choose to give these out as a pack of booking requests, or one by one as each request has been completed.

### During the activity

You will need to check that pupils understand the notation of the booking sheet, and that they realise that “leaving on Wednesday” means guests do not need a room for Wednesday night.

You may choose to introduce the final three messages one by one and ask pupils to compose replies to each enquiry, explaining the reasons for their decisions.

### Probing questions and feedback

AMP activities are well suited to formative assessment, enabling pupils to discuss their understanding and decide how to move forward. See [www.nuffieldfoundation.org/whyAMP](http://www.nuffieldfoundation.org/whyAMP) for related reading.

- Why did you put this guest in this room? Could they have been placed in any other room?
- How did you organise your work?
- What is your priority when you respond to people’s requests? What are the consequences for the guest house and for other people?

### Extensions

- Use contacts to find out how bookings are managed at a local hotel, theatre, and so on.
- Design forms that could be completed electronically by guests requesting bookings.
- Undertake cost analyses for the guesthouse, based upon real costs found on the Internet and assumed occupation rates.
- Investigate the internet to find examples of software packages that could be used for this or similar tasks, or places where such software is being used already.

## Progression table

The table below can be used for:

- sharing with pupils the aims of their work
- self- and peer-assessment
- helping pupils review their work and improve on it.

The table supports formative assessment but does not provide a procedure for summative assessment. It also does not address the rich overlap between the processes, nor the interplay of processes and activity-specific content. Please edit the table as necessary.

| <b>Representing</b><br><i>Using the booking sheet or other format to represent decisions</i><br><i>Identifying factors that affect how bookings can be managed</i> | <b>Analysing</b><br><i>Extracting relevant information accurately and working logically within the constraints to optimise a solution</i>          | <b>Interpreting and Evaluating</b><br><i>Interpreting the effects of decisions and other possibilities at each stage, and working towards better solutions</i> | <b>Communicating and reflecting</b><br><i>Communicating decisions clearly, with reasons where appropriate.</i>                                       |
|--|--|--|--|
| Uses the booking sheet provided without any amendment to the format<br><b>Group A</b>  | Accurately completes the booking sheet for the first two booking requests  |  | Initial solution is presented clearly  |
| Extracts relevant information from requests using the floor plan data  | Continues to complete the booking form accurately for further requests, using the room plan to take account of specific requests<br><b>Group B</b> | Shows understanding of the booking form through accurately indicating when each room is vacated<br><b>Group B</b>  | Accurate booking sheet easily interpreted by others<br><b>Group B</b>  |
| Recognising the essential elements of clients' requests, coordinating requests between booking, enquiry and room plan<br><b>Group C</b>                            | Provides a solution meeting the needs of most requests with a completed booking enquiry log<br><b>Group C</b>                                      | Understands and can explain how the booking form and telephone log can be used to check how well each client's requirements have been met<br><b>Group C</b>    | Uses the log sheet to explain when and why requests cannot be met in full<br>Acknowledges that there may be better solutions                         |
| Recognises the need to balance guests' requests and the need for rooms to be occupied on as many nights as possible  | Adjusts an initial solution appropriately to accommodate more requests   | Understands and can explain how the booking form can be amended to produce a better arrangement  | Completes a full, legible set of records that meet the criteria for each stage of the task. Explains how decisions were made over the final requests |



## Sample responses

### Group A

These pupils understand the task and have continued the dates into the next week, but included overnight on the day of departure for two bookings.

They have managed the initial flow of information satisfactorily and have begun to complete the telephone booking sheet correctly.

### Probing questions

- The booking sheets show the nights the rooms are occupied. What is the last night Mr George needs his room? When is the last date he should appear on the booking sheet?
- Which day do the Allens leave on? What is the last night they will be staying?

| NIGHT     | DATE     | ROOM 1            | ROOM 2        | ROOM 3              | ROOM 4               | ROOM 5         |
|-----------|----------|-------------------|---------------|---------------------|----------------------|----------------|
| MON NIGHT | June 1st | Mr and Mrs Jones  | Mr Sands      | Ms Quick            | Mr and Mrs Frederick | John Frederick |
| TUE NIGHT | June 2nd |                   | Ms Singh      |                     |                      |                |
| WED NIGHT | June 3rd |                   |               | Mr and Mrs Anderson |                      |                |
| THU NIGHT | June 4th |                   |               |                     |                      |                |
| FRI NIGHT | June 5th |                   | Mr Patel      | Mr and Mrs Allen    |                      |                |
| SAT NIGHT | June 6th |                   |               |                     | Mr and Mrs Rogers    | Mr George      |
| SUN NIGHT | June 7th | Mr and Mrs Peters | Dennis Peters |                     |                      |                |

| NIGHT     | DATE   | ROOM 1 | ROOM 2 | ROOM 3 | ROOM 4 | ROOM 5 |
|-----------|--------|--------|--------|--------|--------|--------|
| MON NIGHT | June 8 |        |        | LAETS  | PALES  |        |
| TUE NIGHT | 9      |        |        |        |        |        |
| WED NIGHT | 10     |        |        |        |        |        |
| THU NIGHT | 11     | Bates  |        |        |        |        |
| FRI NIGHT | 12     |        |        |        |        |        |
| SAT NIGHT | 13     |        |        | REMARK |        |        |
| SUN NIGHT | 14     |        |        |        |        |        |

| DATE                 | TIME     | CALLER                           | BOOKING REQUESTED<br>(Type of room and dates of nights)   | REPLY   |
|----------------------|----------|----------------------------------|---|---|
| June 4               | 6.15 pm  | Mr Patel                         | Single with bath, 5th and 6th June  | Agreed to book single without bath  |
| June 4               | 6.25 pm  | Mr and Mrs Peters and son Dennis | Double and single for 7th June (Dennis with bath)   | Booked as asked   |
| June 4               | 8.00 pm  | Mr Baynes                        | Single for 8 June. May stay longer if the weather is good   | June 8 booked. At the moment we shall have space for the rest of the week. We cannot reserve a room unless he stays definitely. |
| June 5               | 11.00 am | Mr Richardson                    | Double Room with bath for 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st | Can reserve motorable room but not a bath   |
| June 5 <sup>th</sup> | 10.00 am | Miss Atard                       | Room 12 <sup>th</sup> June, 13 <sup>th</sup> June single room with a bath.  | Miss Atard is booked on to room 5   |
|                      |          |                                  |   |   |
|                      |          |                                  |   |   |
|                      |          |                                  |   |   |
|                      |          |                                  |   |   |
|                      |          |                                  |   |   |
|                      |          |                                  |   |   |
|                      |          |                                  |   |   |

## Group B

These pupils have accurately interpreted several requests. They have added additional bookings systematically in appropriate rooms.

They recognise that not all requests can be met and that it is important to try to place everyone if possible.

They complete the enquiry log. Although decisions are clearly recorded, they experience difficulties in summarising the booking requests concisely.

(See more of their work on the next page.)

### Probing questions

- How could you accommodate as many guests as possible?
- Are there other ways of allocating the rooms to suit more people?

| NIGHT     | DATE     | ROOM 1            | ROOM 2        | ROOM 3              | ROOM 4               | ROOM 5         |
|-----------|----------|-------------------|---------------|---------------------|----------------------|----------------|
| MON NIGHT | June 1st | Mr and Mrs Jones  | Mr Sands      | Ms Quick            | Mr and Mrs Frederick | John Frederick |
| TUE NIGHT | June 2nd |                   | Ms Singh      |                     |                      |                |
| WED NIGHT | June 3rd |                   |               | Mr and Mrs Anderson |                      |                |
| THU NIGHT | June 4th |                   |               |                     |                      |                |
| FRI NIGHT | June 5th |                   | Mr Patel      | Mr and Mrs Allen    |                      |                |
| SAT NIGHT | June 6th |                   |               |                     | Mr and Mrs Rogers    | Mr George      |
| SUN NIGHT | June 7th | Mr and Mrs Peters | Dennis Peters |                     |                      |                |

| NIGHT     | DATE      | ROOM 1     | ROOM 2      | ROOM 3              | ROOM 4        | ROOM 5      |
|-----------|-----------|------------|-------------|---------------------|---------------|-------------|
| MON NIGHT | June 8th  |            | Mr Bourne   | The Allens          | George Mochie | Mr George   |
| TUE NIGHT | June 9th  |            |             |                     |               |             |
| WED NIGHT | June 10th |            | Mr Stein    |                     |               |             |
| THU NIGHT | June 11th | A. Bessell |             |                     |               |             |
| FRI NIGHT | June 12th |            |             |                     |               | Miss Hecord |
| SAT NIGHT | June 13th |            | Sally Cates | Mr and Mrs Richmond |               |             |
| SUN NIGHT | June 14th |            |             |                     |               |             |

| NIGHT     | DATE      | ROOM 1     | ROOM 2 | ROOM 3 | ROOM 4        | ROOM 5 |
|-----------|-----------|------------|--------|--------|---------------|--------|
| MON NIGHT | June 15th | A. Bessell |        |        | George Mochie |        |
| TUE NIGHT | June 16th |            |        |        |               |        |
| WED NIGHT | June 17th |            |        |        |               |        |
| THU NIGHT | June 18th |            |        |        |               |        |
| FRI NIGHT | June 19th |            |        |        |               |        |
| SAT NIGHT | June 20th |            |        |        |               |        |
| SUN NIGHT | June 21st |            |        |        |               |        |

## Group B continued

(See the notes on the previous page.)

| DATE   | TIME    | CALLER                              | BOOKING REQUESTED<br>(Type of room and dates of nights)   | REPLY  |
|--------|---------|-------------------------------------|---|--|
| June 6 | 6.15pm  | Mr Patel                            | Single with bath; 5th and 6th June  | Agreed to book single <u>without</u> bath  |
| June 6 | 6.25pm  | Mr and Mrs Peters<br>and son Dennis | Double and single for 7th June<br>(Doubt with bath)   | Booked as asked  |
| June 6 | 8.00pm  | Mr Baynes                           | Single for 8 June. May stay<br>longer if the weather is good  | June 8 booked. At the moment we shall have<br>space for the rest of the week. We cannot<br>reserve a room unless he says definitely. |
| June 5 | 9.15am  | Mr and Mrs<br>Richmond              | Double room, clean bath<br>just for one night   | Agreed to book<br>double <u>without</u> bath   |
| June 5 | 10.00am | Miss Hazel                          | Single room, queen size pillow<br>covering, with bath<br>requested                                    | Booked as asked  |
| June 5 | 11.00am | George<br>Broadford                 | he wants a room<br>for tonight  | NO spare rooms   |
| June 5 | 11.55am | Mr Stain                            | single room, 2 nights<br>from 10th June   | Booked as asked  |
| June 5 | 11.30am | Mrs Evans                           | Arrive 11th June, need<br>room with <u>fridge</u><br>wooden <u>table</u>                              | No spare rooms   |
| June 5 | 1.05pm  | Sally Giles                         | room Saturday night<br>with sea views +<br>bath   | Agreed to book<br>single <u>without</u> bath   |
| June 5 | 3.00pm  | Mr Baynes                           | Room yesterday booked<br>for Monday he decides<br>to stay till Friday morning                         | NO spare rooms<br>(but will be in holiday, about)  |
| June 5 | 2.30pm  | Mrs Blondest                        | come for a week, double<br>private en. Monday, double<br>private on Monday, room<br>lessons on Friday | No spare rooms   |

## Group C

| NIGHT     | DATE      | ROOM 1          | ROOM 2    | ROOM 3            | ROOM 4          | ROOM 5     |
|-----------|-----------|-----------------|-----------|-------------------|-----------------|------------|
| MON NIGHT | June 8th  | Mr Brynes →     |           |                   | Mr & Mrs Machie |            |
| TUE NIGHT | June 9th  |                 |           |                   |                 |            |
| WED NIGHT | June 10th |                 |           |                   |                 | Mr Stain   |
| THU NIGHT | June 11th | Mr & Mrs Baseel | Mrs Evans |                   |                 |            |
| FRI NIGHT | June 12th |                 |           |                   |                 | Miss Heard |
| SAT NIGHT | June 13th |                 |           | Mr & Mrs Richmond |                 |            |
| SUN NIGHT | June 14th |                 |           |                   |                 |            |

| DATE   | TIME     | CALLER                           | BOOKING REQUESTED<br>(Type of room and dates of nights)    | REPLY  |
|--------|----------|----------------------------------|--|--|
| June 4 | 6.15pm   | Mr Patel                         | Single with bath, 5th and 6th June                         | Agreed to book single without bath   |
| June 4 | 6.45pm   | Mr and Mrs Peters and son Dennis | Double and single for 7th June (Double with bath)          | Booked as asked  |
| June 4 | 8.00pm   | Mr Baynes                        | Single for 8 June. May stay longer if the weather is good. | June 8 booked. At the moment we still have space for the rest of the week. We cannot reserve a room unless he says definitely. |
| June 5 | 9.45am   | Mr & Mrs Richmond ✓              | double room with own bath sat-wed 12th June                | double bed no bath room agreed. (room 3)   |
| June 5 | 10.00    | Miss Heard ✓                     | Single room + bath 12th June - Sunday at the most          | booked as requested (room 5)   |
| June 5 | 11.0 am  | George Bradbell ✓                | room for evening 5th June                                  | no free room   |
| June 5 | 11.15 am | Mr Stain ✓                       | Single room 10-11th June (two nights)                      | booked as requested in room 5  |
| June 5 | 11.30am  | Mrs Evans ✓                      | wanted room 11 June - booking                              | booked as requested in room 2  |
| June 5 | 1.05 pm  | Sally Sikes ✓                    | room + bath + sea view                                     | not bookable   |
| June 5 | 3.00pm   | Mr Brynes                        | room whole week  | no room  |
| June 5 | 2.30pm   | Mrs Blakeley                     | double room mon sun 5-12                                   | not bookable   |

These pupils have created a solution, logged accurately the information as it has become available, and found a suitable booking where possible, presenting the information clearly.

Further alternatives could have been considered to accommodate more requests.

- For example, Mr Baynes might have been happy with a room change which could have improved the solution.

### Probing question

- How do you know if you have considered all the possible solutions to the booking requests and found the best one?