

Beach guesthouse

Applying Mathematical Processes

This **practical exploration** 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

Equipment

Pupil stimulus and booking sheets
Room plans and booking requests
Booking enquiries log and receptionist notes
Computer spreadsheet

Resources

PUPIL STIMULUS

SPREADSHEET


TEACHER SUMMARY

TEACHER GUIDANCE

PROGRESSION TABLE

SAMPLE RESPONSES

Beach guesthouse



Beach Guesthouse
Crest Road
Seascape
Devon EX91 1WJ

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 Penhagyn

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 AMP Pupil stimulus 'Beach guesthouse'
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The
Clothworkers'
Foundation





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 Penhaligon

NEXT WEEK

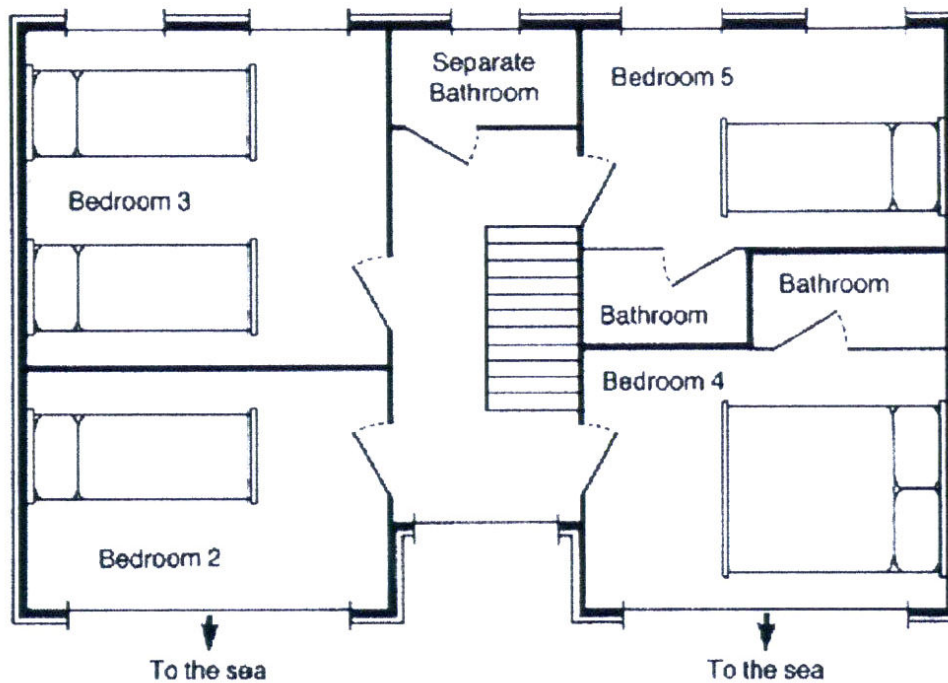
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PS Also enclosed are some bookings from ages ago. Could you please put them on the booking sheet? Make sure they get suitable rooms. The plans show what each room is like.

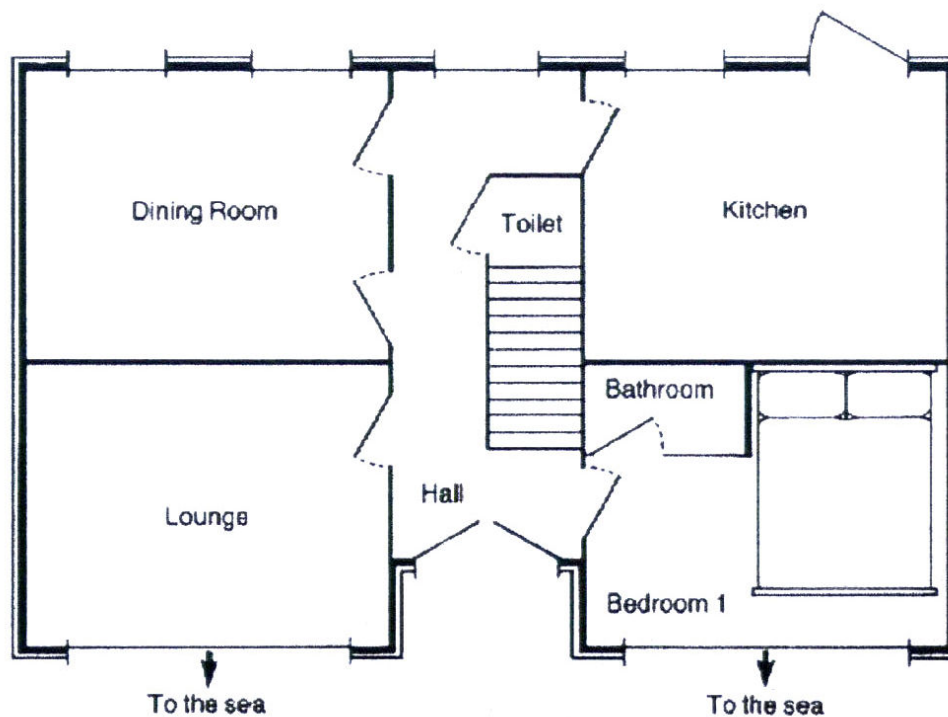




FIRST FLOOR PLAN



GROUND FLOOR PLAN





Room bookings

Name of receptionist

Night	Date	Room 1	Room 2	Room 3	Room 4	Room 5
Monday night	1 st June	Mr & Mrs Jones	Mr Sands	Ms Quick	Mr & Mrs Frederick	John Frederick
Tuesday night	2 nd June		Mrs Singh			
Wednesday night	3 rd June			Mr & Mrs Anderson		
Thur night	4 th June					
Fri night	5 th June		Mr Patel	Mr & Mrs Allen		
Sat night	6 th June				Mr & Mrs Rogers	Mr George
Sun night	7 th June	Mr & Mrs Peters	Denis Peters			

Night	Date	Room 1	Room 2	Room 3	Room 4	Room 5
Monday night	8 th June					
Tuesday night	9 th June					
Wednesday night	10 th June					
Thursday night	11 th June					
Friday night	12 th June					
Saturday night	13 th June					
Sunday night	14 th June					





Room bookings *continued*

Night	Date	Room 1	Room 2	Room 3	Room 4	Room 5
Monday night	15 th June					
Tuesday night	16 th June					
Wednesday night	17 th June					
Thursday night	18 th June					
Friday night	19 th June					
Saturday night	20 th June					
Sunday night	21 st June					

Night	Date	Room 1	Room 2	Room 3	Room 4	Room 5
Monday night	22 nd June					
Tuesday night	23 rd June					
Wednesday night	24 th June					
Thursday night	25 th June					
Friday night	26 th June					
Saturday night	27 th June					
Sunday night	28 th June					





Booking enquiry log sheet

Name of receptionist

Notes for the receptionist

Your job is to check the emails and answer the phone, and deal with booking enquiries.

When people want to make a booking, book them in if you can.

You may not be able to give them exactly what they want.

In this case, offer them what you can.

Fill in the Booking enquiries log sheet.

Fill in what they asked for and what you agreed.

Mrs Penhaligon

Date	Time	Name	Booking requested (type of room, with dates)	Reply
<i>4th June</i>	<i>6.15 pm</i>	<i>Mr Patel (email)</i>	<i>Single with bath, 5 and 6 June</i>	<i>Agreed to book single <u>without</u> bath</i>
<i>4th June</i>	<i>6.45 pm</i>	<i>Mr & Mrs Peters and son (telephone)</i>	<i>Double and single for 7 June (double with bath)</i>	<i>Booked as asked</i>
<i>4th June</i>	<i>8 pm</i>	<i>Mr Baynes (telephone)</i>	<i>Single for 8 June. May stay longer if weather is good</i>	<i>8 June booked. At the moment we still have space for the rest of the week, but we cannot reserve a room unless he says definitely</i>





Booking enquiry log sheet

Date	Time	Enquirer	Booking requested (type of room, with dates)	Reply



Beach guesthouse messages

11 cards over 3 pages

This sheet and two further sheets contain booking requests and related messages. They are listed in chronological order.

They can be copied/laminated/cut and can be given to pupils in one go or in a staggered fashion.

Pupils will also need the initial six pages of the pupil stimulus.

14 Richmond Street
Lampthorne
BUCKS
23rd April

REPLY POSTED
4th May

Dear Madam

We would like to stay for a few days in June if you have a suitable room.

My husband is disabled so we need a room on the ground floor with its own bathroom.

If you do have a room like this we would like to come from the 11th to the 18th June.

Yours faithfully
A Bessell (Mrs)

To: George Mackie [gmackie@dotmail.co.uk]
From: Beach Guesthouse
Subject: Room reservation
Sent: 19/05/10 09:12

Dear Mr Mackie

This is to acknowledge receipt of your booking request. I confirm we can meet your request and look forward to seeing you on 8th June.

Beach Guesthouse

From: George Mackie
To: Beach Guesthouse
Subject: Room reservation
Sent: 19/05/10 08:35

My wife and I would like to reserve a double room with a bath, and with a view of the sea if possible.

We will arrive on Monday 8th June and stay until Friday 19th.

George Mackie

TELEPHONE MESSAGE

FOR: Reception
FROM: Mr. Baynes
PHONE NUMBER: (call box)

DATE: 4 June
TIME: 8.00pm

MESSAGE:

He wants a room for the night of Monday 8th June. He may stay longer if the weather is good.



TELEPHONE MESSAGE

FOR: Reception DATE: 5th June
FROM: Mr. and Mrs. Richmond TIME: 9.45 am
PHONE NUMBER: 01706 714 214
MESSAGE:

*Could they have a double room,
preferably with its own bath, for next
Saturday (13th June)? Just for one night.*

TELEPHONE MESSAGE

FOR: Reception DATE: 5th June
FROM: George Bradford TIME: 11.00 am
PHONE NUMBER: (call box)
MESSAGE:

*Could he have a room for
tonight? ^*

TELEPHONE MESSAGE

FOR: Reception DATE: 5th June
FROM: George Bradford TIME: 11.00 am
PHONE NUMBER: (call box)
MESSAGE:

*Could he have a room for
tonight? ^*

EMAIL

From: M Stain [mstain323@hotmail.com]
To: Beach Guesthouse
Subject: Room reservation
Sent: 5/06/10 11:15

I would like to book a single room for two nights
from Wednesday 10 June. Please can you confirm if
you have one available.

Michael Stain



EMAIL

From: Mrs J Evans [mrsevans21@hotmail.com]
To: Beach Guesthouse
Subject: Room reservation
Sent: 5/06/10 11:30

I am arriving Thursday 11 June for a long weekend stay. I will need a room until Tuesday lunchtime.

Mrs J Evans

TELEPHONE MESSAGE

FOR: Reception DATE: 5th June
FROM: Mrs. Blakeley TIME: 2.30pm
PHONE NUMBER: 723114 until Sunday lunchtime
MESSAGE: 1

Would like to come for a week, arriving on Monday, leaving on Friday.
Do you have a double room?

TELEPHONE MESSAGE

FOR: Reception DATE: 5th June
FROM: Sally Giles TIME: 1.05pm
PHONE NUMBER:

MESSAGE: She wants a room for Saturday night 13th June with a sea view and bath.

TELEPHONE MESSAGE

FOR: Reception DATE: 5th June
FROM: Mr. Baynes TIME: 3.00 pm
PHONE NUMBER: Call box
MESSAGE:

He rang yesterday and booked for Monday night. He has now decided he would like to stay till Friday morning.
If you can't take him all week he won't come at all.



NUFFIELD APPLYING MATHEMATICAL PROCESSES

TEACHER NOTES Beach guesthouse

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, room plans, notes for receptionist with booking log, booking sheets, booking requests

Equipment

Pupil stimulus and booking sheets

Room plans and booking requests

Booking enquiries log and receptionist notes

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
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Devon EX91 1UJ

Friday morning 8 a.m.
June 5th

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Show me when you've finished.

Mrs Penhaligon

NEXT WEEK

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Teacher guidance

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.

The activity could be introduced using the following scenario:

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

- 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?

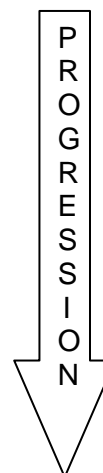
Extensions

- 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

Representing	Analysing	Interpreting and Evaluating	Communicating and reflecting
<i>Using the booking sheet or other format to represent decisions</i> <i>Identifying factors that affect how bookings can be managed</i>	<i>Extracting relevant information accurately and working logically within the constraints to optimise a solution</i>	<i>Interpreting the effects of decisions and other possibilities at each stage, and working towards better solutions</i>	<i>Communicating decisions clearly, with reasons where appropriate.</i>
Uses the booking sheet provided without any amendment to the format Group A	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 Group B	Shows understanding of the booking form through accurately indicating when each room is vacated Group B	Accurate booking sheet easily interpreted by others Group B
Recognising the essential elements of clients' requests, coordinating requests between booking, enquiry and room plan Group C	Provides a solution meeting the needs of most requests with a completed booking enquiry log Group C	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 Group C	Uses the log sheet to explain when and why requests cannot be met in full 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



Download a Word version of this Progression Table from
www.nuffieldfoundation.org/AMP



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			LAKE	LAKE	
TUE NIGHT	9					
WED NIGHT	10					
THU NIGHT	11	BROOK				
FRI NIGHT	12					
SAT NIGHT	13			LAKE		
SUN NIGHT	14					

DATE	TIME	CALLER	BOOKING REQUESTED (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 with bath
June 4	6.45 pm	Mr and Mrs Peters and son Dennis	Double and single for 7th June (double 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 says definitely.
JUNE 5	11.00 am	Mr Richmond	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 5th	10.00 am	Miss Heard	Room 12th June, 13th June. Single room with a bath.	Miss Heard is booked in 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 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 Quirk	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 Macfie	Mr George
TUE NIGHT	June 9th					
WED NIGHT	June 10th		Mr. Stain			
THU NIGHT	June 11th	A. Brown				
FRI NIGHT	June 12th					Miss Macfie
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	Mr. Brownell			George Macfie	
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 (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	6.45pm	Mr and Mrs Peters and son Dennis	Double and single for 7th June (Double with bath)	Booked as asked
June 6	8.00pm	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 says definitely.
June 5	9.15am	Mr and Mrs Richmond	Double room, clean bath just for one night	Agreed to book double <u>without</u> bath
June 5	10.00am	Miss Hazel	Single room, queen size bed covering, with bath requested	Booked as asked
June 5	11.00am	George Broadford	he wants a room for tonight	No spare rooms
June 5	11.5am	Mr Stain	single room, 2 nights from 10th June	Booked as asked
June 5	11.30am	Mrs Evans	Arrive 11th June, need room until Tuesday week end	No spare rooms
June 5	1.05pm	Sally Giles	room Saturday night with sea views + bath	Agreed to book single <u>without</u> bath
June 5	3.00pm	Mr Baynes	Single room, queen size bed for Monday he decides to stay till Friday morning	No spare rooms (but he is on the holiday list)
June 5	2.30pm	Mr Blakesley	come for a week, double room on Monday, double room on Friday	No spare rooms



Group C

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.

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 Bazel	Mrs Evans		↓	↓
FRI NIGHT	June 12th	↓	↓	↓	↓	Miss Heard
SAT NIGHT	June 13th	↓	↓	↓	Mr & Mrs Richmond	↓
SUN NIGHT	June 14th	↓	↓	↓	↓	↓

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

DATE	TIME	CALLER	BOOKING REQUESTED (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 <u>without</u> bath
June 4	6.45pm	Mr and Mrs Peters and son Dennis	Double and single for 7th June (Dennis 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	10.00am	Miss Heard ✓	Single room + bath 12th June - Sunday afternoon	booked as requested (room 5)
June 5	11.00am	George Biddell ✓	room for evening 5th June	no free room
June 5	11.15am	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 - evening	booked as requested in room 2
June 5	1.05pm	Sally Giles ✓	room with bath + sea view	not bookable
June 5	3.00pm	Mr Baynes	room whole week	no room
June 5	2.30pm	Mrs Blakeley	double room mon sun 5-12	not bookable

Probing question

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