Henry is thinking.

'How do I encode the localizable sentences for seeking information about relatives and friends after a disaster. Let's have a look at it.

'It is already policy to use six digit codes starting three one three.

'And I would like to avoid zeros and I would like to avoid having two digits the same next to each other and .... preferably .... I would like to not use any digit more than twice so that if perchance hardcopy discs are being used then two sets will do the job .... maybe hardcopy discs will never be used for this but I can't be 100% sure of that, so try to allow for it just in case - if I can.'

A pause.

'The bit about not using any digit more than twice could get a bit tricky to work out as there is already a one being used. .... So maybe best to split it into two coding problems side by side.

'So have the first coding problem as three one three one x y ....

and have the second coding problem as three one three p q r ....

'So x could be any of seven digits, namely two, or any of four through to nine ....

'and then y could be any of those seven digits as long as it is not the same as x, so a choice of six digits .... the particular six digits depending upon the choice made for x ....

'yes ....

'So forty-two possible codes.

A pause.

'So what about the codes that are of the form three one three p q r ....

'That might be trickier ....

'Right, so p cannot be zero, one or three .... but it can be any of the other seven digits .... namely two, or any of four through to nine .... the same as for x actually ....

'Then q can be any of eight digits one, two, or any of four through to nine as long as it is not the same as p .... so in fact only seven choices depending upon which choice is made for p ....

'Now, what the choice for r ....

A pause.

'r cannot be the same as q, but it could be the same as p, so no need to bring p into it.

' .... so r could be one of eight possible digits but it must not be the same as q, so there are seven choices.

'So that would be seven times seven times seven choices, which is seven cubed, which is three hundred and forty-three ....

'Is that right' thinks Henry. 'Six choices for y but seven choices for r .... have I got that right? .... but then y is restricted because in that problem the digit one has already been used twice so cannot be used for y, yet in this problem the digit one can be used for r unless it has been used for q, in which case that would free-up a digit that could have been used for q to be used for r. .... Yes, I think that that is right ....'

Yet Henry is a little cautious about this as he is not absolutely sure, almost sure but not absolutely sure.

'However, it is not as if I am going to publish that number before checking it in practice .... but if I am right .... and I am almost sure that I am .... that gives a total of three hundred and eighty-five codes starting with three one three that fit the restrictions that I have chosen to use.'

Henry decides to take a break and goes to the staff common room to have a cup of peppermint tea.

Later, Henry returns to the problem.

'So, probably three hundred and eighty-five codes available so let us start thinking about assigning some of them ....

Henry decides to start by looking at the text of the play and the messages sent by Albert Johnson and Sonja in the play.

Henry starts by looking at the message sent by Albert Johnson.

Is there any information about the following person please?

Margaret Gattenford

The person is female.

Also, is there any information about the following person please?

Anne Johnson

The person is female.

The person is the niece of the first person that was named.

The name of the enquirer is as follows.

Albert Johnson

The enquirer is the brother of the first person that was named.

Henry thinks about this.

'I could try to assign codes for that message, but if I do I could end up having codes in other than the best possible order. .... Let me think about this ....

Henry has a look at the list of glyphs and meanings that Caroline used as the basis for her talk in the café, and starts counting how many there are in total.

'That is two plus two plus four groups each of sixteen plus another twelve, so a total of eighty, which is well within three hundred and eighty-five. Caroline said that in her talk someone asked about other relationships such as in-laws and I suppose that we should make provision for some other situations such as work colleagues and so on, though maybe they could be enquired about in two separate emails. .... Though if they are travelling together .... hmm I'll think about that sometime. But back to this coding problem.

'I wonder if rather than just assign numbers in a sequence if I could have some sort of structure in the code numbers chosen, particularly for those four groups each of sixteen.'

A pause.

'There are four groups - person (male) is ...., person (female) is ....., enquirer (male) is ...., enquirer (female) is ...., and in each of them there is an upper line, or a middle line, or a lower line in the glyph. So four groups and three lines. .... So I could have p as two, four, six and eight for the groups and then q as five, seven and nine for the lines, and then have r as one for the basic one with just the line and have r as two with the line and a vertical at the right-side. Would that work, at least to get started with some of them.

'For example, let me write a few down using the exclamation mark as the base character

!313251 The person is the father of the first person that was named.

!313252 The person is the uncle of the first person that was named.

!313451 The person is the mother of the first person that was named.

!313452 The person is the aunt of the first person that was named.

!313651 The enquirer is the father of the first person that was named.

!313652 The enquirer is the uncle of the first person that was named.

!313851 The enquirer is the mother of the first person that was named.

!313852 The enquirer is the aunt of the first person that was named.

'So those all have q as having a value of five. So, changing the five to a seven gives codes for another eight sentences, with husband, brother, wife and sister respectively.

'Then changing the original five to a nine gives codes for another eight sentences with son, nephew, daughter and niece respectively.

'So in the play, the sentence

The enquirer is the brother of the first person that was named.

would have the code of, well, it starts as three one three then it is male enquirer so the next digit is a six, then the horizontal line is in the middle so the next digit is a seven and then there is a vertical line at the right-side so it is a two, so it is

!313672 The enquirer is the brother of the first person that was named.

'Yes!

'So that is four sentences from each of the four groups of sixteen.

A pause.

Henry notes that in each group of sixteen sentences that there are eight that have q as five, two that have q as seven, and six that have q as nine. The eight includes cousin and friend, which is why there are more with q as five than with q as nine. There are more for q as five or nine rather than for q as seven because q as five or nine each include several generations of people.

A pause.

'So r would need to have six extra values available when q is five, but it cannot have zero or three, ... and one and two have been used already .... and it cannot be five, so it cannot be done. .... So the sentence with friend will need a different coding, but the others can be fitted in.

'So if I have try to have them in increasing order of complexity of the glyph designs I can have for values of r as follows

4 grandfather

6 great uncle

7 great grandfather

8 great great uncle

9 cousin (male)

Henry pauses and thinks.

'and there are only two when q has a value of seven, so they are done, then when q has a value of nine I cannot let r have a value of nine, but I do not need to as there are fewer sentences when q is nine than when q is five.

4 grandson

6 great nephew

7 great grandson

8 great great nephew

So now I need to find where to place the code for friend, bearing in mind that there are separate sentences for friend (male) and friend (female).

'So if I use one of the spare places when q is seven that could do it. So for r use nine as friend is not a relative, in case extra codes are needed.

'So, what code does that give for the code numbers.

Henry stops to think and checks back, then writes down the following.

!313279 The person is the friend of the first person that was named. (male)

!313479 The person is the friend of the first person that was named. (female)

!313679 The enquirer is the friend of the first person that was named. (male)

!313879 The enquirer is the friend of the first person that was named. (female)

A pause.

'Ah,' thinks Henry 'a good start. I have got a structure of the code numbers for sixty-four of the eighty sentences in this group.'

A pause.

'Now, in order to be able to encode the message that Albert Johnson sends in the play, I need to encode some more of the localizable sentences that he uses. So with a sort of resonance to one two three being "Good day." and one two seven being "Welcome." I could have three one three one two .... ah, I can't do that as that would use more than two digit three characters and I am trying to avoid having more than two of any digit, so use three one three one two five for "Is there any information about the following person please?" .... and three one three one two seven for "Also, is there any information about the following person please?".

'So those are, using the exclamation mark as the base character here,

!313125 Is there any information about the following person please?

!313127 Also, is there any information about the following person please?

'Then I need to encode "The person is female." for the message from the play and I might as well encode the male version at the same time. How about p is five for information about the person and p is seven for information about the enquirer and p is nine for replies .... but maybe better to just have p is nine for basic replies and have more detailed answers - and unhappy answers - in a sparsely populated part of the code number map that starts with, say, five one five so that that will have a longer code number and can be set up to be sparsely populated so as to give a bit more protection against errors in transmission.

'But anyway, for the moment, let us have the following.

!313987 The person is safe.

and as I am a bit unhappy with using just "No." in the text of the play, let us have

!313985 There is no information available at this time.

as an extra sentence. .... Yes.

A pause.

'Ah, yes, I need to add the other two ....

!313591 The person is male.

!313592 The person is female.

A pause.

'Ah, I need to choose a code number for "The name of the enquirer is as follows."

!313794 The name of the enquirer is as follows.

Yes, use the four rather than have a one because although they are not encoded at present it could be good to add two sentences regarding the gender of the enquirer.

'Yes, I think that that does enough for the messages from the play, the two messages that are read out and the one message saying that they are safe.

'So, for completeness, I'll write out the codes with the names for the first message.

!313125

Margaret Gattenford

!313592

!313127

Anne Johnson

!313592

!313492

!313794

Albert Johnson

!313672

Henry glances down the document and notices that the code number on two successive lines each end with a nine and a two.

Henry looks carefully at these in case he has made a mistake.

Yet no, all is well, the reasons for having nine and two are different on the two lines.

'So, a few more to encode later, mostly about contact information for the enquirer - though there are those two about passing a message to the person.

'Good.'

'So, copy the two versions, the one with the codes as localized into English, and the other with the localizable sentences expressed in a language-independent format, onto one page for easier comparison of the two.'

Is there any information about the following person please?

Margaret Gattenford

The person is female.

Also, is there any information about the following person please?

Anne Johnson

The person is female.

The person is the niece of the first person that was named.

The name of the enquirer is as follows.

Albert Johnson

The enquirer is the brother of the first person that was named.

!313125

Margaret Gattenford

!313592

!313127

Anne Johnson

!313592

!313492

!313794

Albert Johnson

!313672