Level 1 Sounds in isolation

1 Introduction

As you can see, the phonemic chart (Fig. 1) has three main sections. The vowels are shown in the upper half, monophthongs /mɒnəfθɒŋz/ on the left, and diphthongs /dɪpθɒŋz/ or /dɪfθɒŋz/ on the right. The consonants /kɒnsənənts/ are shown in the lower half. The colon by five of the vowel symbols indicates length. The box in the top right-hand corner contains stress and intonation symbols.

iː	ɪ	ʊ	uː	ɪə	eɪ	ˈ ˌ	
e	ə	ɜː	ɔː	ʊə	ɔɪ	əʊ	
æ	ʌ	ɑː	ɒ	eə	aɪ	aʊ	
p	b	t	d	tʃ	dʒ	k	g
f	v	θ	ð	s	z	ʃ	ʒ
m	n	ŋ	h	l	r	w	j

Fig. 1: The phonemic chart

Sounds are all produced in the vocal tract. The vocal tract refers to the parts of the body that contribute to the production of vocal sounds: the lungs, larynx, oral cavity (mouth), lips and nose.

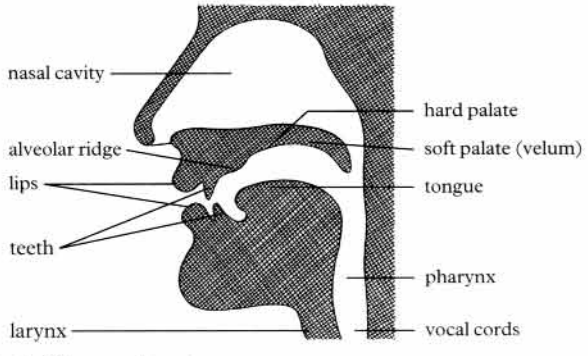

Fig. 2: The vocal tract

To facilitate the learning of the phonemes of standard English, we need to know:

- **how** each sound is produced within the vocal tract (referred to as *manner of articulation*);
- **where** in the vocal tract each sound is produced (referred to as *place of articulation*).

The phonemic chart is arranged to convey much of this information visually.

The first two discovery activities focus on distinguishing monophthongs, diphthongs and consonants. After that they are investigated in more depth.

Discovery activity 1 Distinguishing consonants from vowels

Here we make a first exploration of how and where the sounds are produced, and at the same time distinguish vowels from consonants.

Focusing on your mouth, say these pairs of words slowly, both aloud and whispered, and notice how you make the difference between the two words.

1 eee /iː/ key /kiː/
2 ooh /uː/ two /tuː/
3 or /ɔː/ nor /nɔː/
4 er /ɜː/ sir /sɜː/
5 ah /ɑː/ bar /bɑː/

Commentary ■ ■ ■

In each case the first word consists of a single vowel sound, and the second word consists of the same vowel preceded by a consonant. Notice that the vowel sound on its own has no particular restriction to the air flow, though it does require a particular 'posture' of the tongue, jaw and lips. The second word of each pair begins with some kind of restriction to the air flow which you then release as you move into the following vowel. Most consonants have their own restriction to the flow of air, which is what gives them their unique sound. (The exceptions are at the right of the bottom row of the chart. We'll return to these later.) ■

Discovery activity 2 Distinguishing two kinds of vowel

Now we'll subdivide the vowel sounds. These pairs of words have the same initial consonant, but different vowels following. What happens in your mouth? Observe carefully your tongue, jaw and lips, and notice how you make the difference between the two words.

1 key /kiː/ kay /keɪ/
2 two /tuː/ toe /təʊ/
3 nor /nɔː/ now /naʊ/
4 sir /sɜː/ sigh /saɪ/
5 bore /bɔː/ boy /bɔɪ/

Commentary ■ ■ ■

What I hope you notice is that in the second word of each pair the tongue/jaw/lip posture changes during the sounding of the vowel, while in the first word there is no such movement. If this is what you found then you are observing the general difference in articulation between monophthongs and diphthongs*. The distinction is particularly important in English and has some very practical classroom implications. ■

*These two words are from the Greek for (respectively) one sound and two sounds: *mono* one; *di* two; *phthoggos* sound or voice.

Learning from the discovery activities

The aim of the first two discovery activities is to make sure that you have noticed *in your own vocal tract* the difference between consonants, monophthongs and diphthongs. If you are uncertain about this distinction you could study Fig. 3, or go back over the discovery activity.

	WHERE	HOW
Monophthongs	The distinguishing quality of each vowel is produced by the shape and size of the resonant space in the mouth. This is controlled by the position and shape of the tongue, lips and jaw.	There is no obstruction to the escape of air through the mouth, and they are all voiced, ie the vocal cords vibrate in the air flow.
Diphthongs	As for monophthongs the distinguishing quality is produced by the tongue, lips and jaw. The difference is that there is one mouth posture at the beginning of the vowel sound, and another at the end. The resulting glide between these two tongue and lip positions gives the diphthong its characteristic 'two-sound' quality.	As with monophthongs there is no obstruction to the escape of air through the mouth, and they are all voiced, ie the vocal cords vibrate in the air flow.
Consonants	The restrictions to the air flow that make the characteristic consonant sounds are made at one of the points of contact between the various speech organs such as tongue, teeth, lips, roof of mouth, etc. All consonants involve some sort of restriction to the air flow except /w/ and /j/.	Restrictions to the air flow can be made in various ways, each giving a different characteristic sound. Restrictions can be produced by friction applied to the air flow, or by a momentary blocking of the air flow followed by a sudden release, or by diverting the air flow through the nose. The use of voicing and unvoicing also characterizes consonant sounds.

Fig. 3: The ***how*** and ***where*** for monophthongs, diphthongs and consonants

In general the aim of each discovery activity is to experience the auditory, visual and physical aspects of sounds. To make this experience more vivid there are three kinds of feedback you can give yourself in the discovery activities:

- kinesthetic feedback: the internal physical sensation of touch and of muscle movement in your throat, mouth, tongue and lips, etc;
- auditory feedback: what you hear, externally through the air, and internally through your head (you can enhance the latter by blocking your ears with your fingers when you speak);
- visual feedback: any physical movement connected with the production of the sound that you can see in yourself or in others (it is very helpful to have a pocket mirror available).

You can also deepen your observations in each activity by making use of three kinds of voicing, each of which reveal different aspects of articulation:

- speaking aloud;
- whispering;
- mouthing silently.

2 Vowels: monophthongs

In the production of vowel sounds, the vocal tract is open so that there is no obstruction to the air flow escaping over the tongue. The characteristic sound of a vowel depends on the shape and size of the resonant space in the mouth. This is determined by:

- the horizontal tongue position (front–centre–back);
- the vertical tongue position (high–mid–low);
- the lip position (rounded–neutral–spread).

And there is a fourth characteristic of vowels which is not dependent on tongue or lip position:

- the typical length or duration of the vowel (long–short).

In this section we'll examine these four variables in turn, and through the discovery activities you will be able to see how you are using these variables when you make vowel sounds. This is important if you want to build up your repertoire of precise and positive techniques for helping learners to shape or reshape their vowel sounds. You will also see how these variables are incorporated in the design of the chart.

The horizontal tongue position

Discovery activity 3 Horizontal tongue position

Say /iː/ as in *tea*, and now /uː/ as in *two*. Alternate the sounds /iː ... uː ... iː ... uː .../. Try this slowly at first and then more rapidly. What internal physical movements do you notice? What do you hear? What can you see in a mirror? It may help you to focus attention on the internal movement if you whisper rather than say the sounds aloud.

Try the same thing with /e/ as in *pen*, and /ɔː/ as in *door*, alternating them /e ... ɔː ... e ... ɔː ... /. With these two sounds the jaw is a little more open than before, and the tongue correspondingly a bit lower. What movement does your tongue make as you slide between these two sounds?

Finally, try the same activities with the pair /æ/ as in *cat*, and /ɒ/ as in *pot*, alternating them /æ ... ɒ ... æ ... ɒ ... /. The tongue is even lower in the mouth and the lip position is more open, but you will still be able to notice the horizontal forwards and backwards movement of the tongue.

Commentary ■ ■ ■

You probably notice two distinct areas of movement: the movement of the lips from a spread position to a rounded position, and the movement of the tongue sliding backwards and forwards in the mouth. For the moment it is the tongue movement we are interested in, and it will help if you try to distinguish between the internal sensations of the tongue and the lip movement.

The next discovery activity helps you to mask off the sensation of lip movement. ■

Discovery activity 4 Isolating your perception of the tongue movement

Say the sound /i:/, and as you do so put the tip of your finger (or a pencil) in contact with the tip of your tongue. Now gradually slide towards the sound /u:/, maintaining the contact between finger and tongue. Alternate the sounds /i: ... u: ... i: ... u: ... /. Try this a few times and you should find that your finger has to move further into your mouth if you are going to keep contact with your tongue.

Another way to focus on your perception of tongue movement is to adopt the mouth position for /i:/. Place a finger along the line of your open lips, gently touching both the top and bottom lip. Now alternate /i: ... u: ... i: ... u: ... / paying attention to the movement of your tongue. The finger on your lips may help you to mask out the sensation of lip movement.

You can also register where your tongue is on the front–back continuum by first saying the vowel and then moving your tongue vertically to touch the roof of your mouth. This sense of contact may indicate how forward or back your tongue is with different vowels.

Try each of these ways of masking off the sensation of lip movement using the other two pairs /e ... ɔ: ... e ... ɔ: ... / and /æ ... ɒ ... æ ... ɒ ... /.

Commentary ■ ■ ■

The aim of these activities is to highlight the role of the backwards and forwards movement of the tongue in determining the vowel sound. We have explored three pairs of vowels, each pair consisting of a vowel with the tongue forward in the mouth and a vowel with the tongue back in the mouth. The vowels produced with the tongue forward are called front vowels, being produced by the front part of the tongue in the front of the mouth. The other vowel in each pair is called a back vowel, being produced by the back of the tongue in the back of the mouth. In Fig. 4 you can see how this relates to the layout of the chart. ■

FRONT				BACK
	iː			uː
	e			ɔː
	æ			ɒ

Fig. 4: Front and back monophthongs

Discovery activity 5 Locating the in-between vowels

Say the sound /i:/, and slowly glide towards the sound /u:/. Listen to the changing quality of the vowel sound, while noticing the movement of the tongue and lips.

Now repeat the glide /i: ... u:/, but this time stop along the way to see what other vowel sounds you arrive at on the continuum between /i:/ and /u:/. In theory there are many sounds possible, but two in particular correspond to English phonemes.

You may find a point soon after starting where you have a sound that corresponds approximately with /ɪ/ as in *it*, and you will have to shape it and shorten it to make it English. As you draw your tongue further back along the continuum you'll find a sound close to /ʊ/ as in *put*. You'll have to make it short to give it its English quality.

You can find other English monophthongs as you move on the continuum between the other front–back pairs. Take the continuum /e ... ɔ:/. As your tongue slides back from /e/ you may be able to locate /ə/ as in *ago*. For this the tongue is in a neutral position, and the tongue and mouth are relaxed. The sound is short and uses relatively little energy. The next sound on this line is /ɜ:/ as in *her*. You may find this in the same place as /ə/, or you may sense that the tongue is slightly further back. This sound is the longer, stressed cousin of /ə/. Again the tongue and mouth are relaxed, but the sound itself has more force. As you move the tongue to the back position, you should find a sound close to /ɔ:/. Here you may get a sensation of the back of the tongue being pulled to the back of the mouth, while the lips are pushed forward.

And now try the continuum /æ ... ɒ/. Here the tongue is in low position and the jaw is open. As you move the tongue back from /æ/ towards /ɒ/ you should find that you pass quite close to /ʌ/. In fact if you stop the tongue at a certain point, and make a very small adjustment, then you should have the sound /ʌ/. Can you find that point? What small adjustment, if any, do you have to make? As your tongue proceeds on its backward journey you will find yourself in the region of /ɑ:/. Again, see what adjustments are necessary.

Finally at the end of that continuum you have /ɒ/, which in English is short.

Commentary ■ ■ ■

In this activity we have found a rough and ready way of discovering vowels lying more or less on a line between other vowels. This is achieved by moving the tongue along the front–back continuum as shown by the three horizontal lines of vowels shown on the chart. (See Fig. 5.)

The aim of this activity is also to help you to become aware of which sounds are neighbours to which others, and exactly what you have to do to change one sound into another. Lip position is also important to 'tune' the sound made by the tongue position.

FRONT	CENTRAL				BACK
	iː	ɪ	ʊ	uː	
	e	ə	ɜː	ɔː	
	æ	ʌ	ɑː	ɒ	

Fig. 5: Front, back and central monophthongs

You probably find that the movements involved are very slight, and at first give you little internal sensation. But as you keep your attention on it, you will find that it becomes more perceptible. Our aim is to gain insights that will qualify us to guide our learners. ■

Summary

Tongue position is the most important variable in determining the sound of a vowel. For each of the twelve English monophthongs the tongue is curved in some way, such that one part of the tongue is closer to the roof of the mouth than any other part. This raised part may be the front of the tongue, raised towards the

hard palate; or the centre of the tongue, raised towards the juncture of hard and soft palate; or the back of the tongue, raised towards the soft palate. The resulting vowels are correspondingly referred to as *front*, *centre* or *back* vowels.

The vertical tongue position (high–mid–low)

To complete the description of a vowel, it is also necessary to fix the position of the tongue on a vertical axis – in other words, to state how far from the roof of the mouth the raised part of the tongue actually is. To describe this the labels *high*, *mid* and *low* are used. *High* denotes that the raised part of the tongue is relatively close to the roof of the mouth, and above the level it holds in 'neutral' position. *Low* denotes that the tongue is relatively distant from the roof of the mouth, and below the level it holds in neutral position. *Mid* indicates a neutral or middle position between these two extremes.

In the next discovery activity we'll explore this vertical positioning, and observe its effect on the mouth shape and on the resulting vowel sound.

Discovery activity 6 Vertical tongue position

Say the sound /iː/ and hold it. Slowly close the gap between the front of your tongue and the roof of your mouth (or more exactly the alveolar ridge, behind the top front teeth). Do this again whispering, and repeat until you have a clear sensation of the inner movement. You'll notice that as soon as you start to raise the tongue from the /iː/ position you start to get friction against the top of the mouth, and if you raise it any further, you stop the sound and the air flow altogether.

What this shows is that in the position for /iː/ the tongue is as high as it can be without causing audible friction.

Now take the position for the sound /æ/, and again close the gap between the front of your tongue and the roof of your mouth, and see how far it is this time. You should find that the gap is much wider than for /iː/. In fact for /æ/ the tongue is low in the mouth. If you can distinguish the physical sensation of these two tongue positions then you are noticing the difference between *high* and *low* tongue position.

Now look at the second vertical column in the monophthong section of the chart, /ɪ/ to /ʌ/. Say each sound in turn, both aloud and whispering. While saying each sound in turn close the gap between your tongue and the top of your mouth. Notice the size of the gap, and also where on the roof of your mouth your tongue touches.

Do the same investigation for the third column, /ʊ/ to /ɑː/, and for the fourth column, /uː/ to /ɒ/.

Commentary ■ ■ ■

In this activity we have explored four high–low pairs of vowels. The first of each requires the tongue to be high, that is as close as possible to the roof of the mouth without actually causing friction, and the second requires the tongue to be low, that is relatively distant from the top of the mouth, and below the neutral point of the tongue. (See Fig. 6.)

You will also have noticed that when your tongue moves between high and low, your jaw tends to move with it from a more closed position to a more open one. We'll investigate this further in discovery activity 9. ■

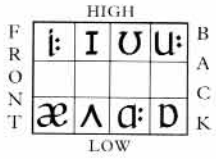

Fig. 6: High and low monophthongs

Discovery activity 7 Finding the in-between sounds in the vertical continuum

Take the first monophthong column on the chart, /iː/ to /æ/. Say /iː/, and gliding slowly towards /æ/, listen carefully to the changing vowel quality as your tongue lowers and your jaw opens. Stop at several points along the way, and see what vowel you have discovered. In theory there are many possibilities. In practice only one is English. About halfway between /iː/ and /æ/ you can isolate the sound /e/. Here the tongue is in mid or neutral position vertically, and in a front position horizontally. Try this both aloud and whispering.

Do the same with the second monophthong column, /ɪ/ to /ʌ/. Glide slowly from /ɪ/ to /ʌ/ while saying the sound, and notice the other 'in-between' vowel sounds that you can make if you stop the movement at any point. About halfway down this vertical glide, when the tongue is in mid or neutral position, you should find a sound which when made short, and with tongue and mouth relaxed, sounds like /ə/. This is known as a centre vowel because the tongue, jaw and lips are all in a relaxed, neutral posture.

Try the same sequence of experiments for the third vertical column, /ʊ/ to /ɑː/. At a point roughly midway you should find /ɜː/, which needs some length, and again requires your mouth, tongue and lips to be relaxed. This is also a centre vowel, and you may find that your tongue is in the same position as for /ə/, or it may be just a little further back.

Try the same sequence of experiments with the fourth vertical column, /uː/ to /ɒ/. At a point roughly midway between /uː/ and /ɒ/ you should find /ɔː/, which needs length, but also needs your tongue to be well back, giving the sensation of being bunched up at the back of your mouth. Rounding the lips is also important to achieve the exact acoustic quality. (More about this in the section on lip position, following discovery activity 11.)

Commentary ■ ■ ■

In this activity we find that there is a position approximately midway between *high* and *low* where a third English vowel is produced. These *mid* sounds are shown in Fig. 7 on p 10. Lip position is also important to 'tune' the sound made by the tongue position. ■

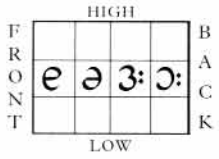

Fig. 7: The mid-vowels on the vertical continuum

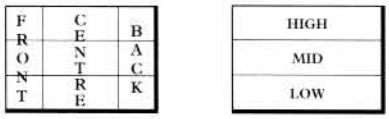

Fig. 8: Summary of tongue positions: front–centre–back and high–mid–low

The traditional vowel box and the *Sound Foundations* phonemic chart

Traditionally the front–back and high–low co-ordinates of tongue position have been shown on a vowel box (Fig. 9a). A great number of different vowel sounds are possible within this vowel box, yet each language makes use of only a few of them, dividing up the space available to suit its own requirements.

The traditional vowel diagram (Fig. 9a) is transferred to the *Sound Foundations* phonemic chart (Fig. 9b) to give the layout shown in Fig. 9c. Fig. 9d shows how the chart relates to the mouth.

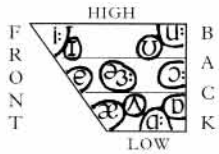

Fig. 9a

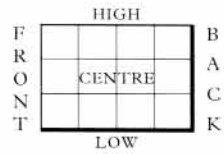

Fig. 9b

iː	ɪ	ʊ	uː
ɐ	ə	ɜː	ɔː
æ	ʌ	ɑː	ɒ

Fig. 9c

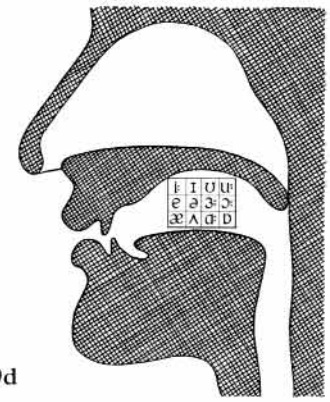

Fig. 9d

Discovery activity 8 Experiment with all the monophthongs

Look at the monophthong part of the phonemic chart.

1 Take any horizontal or vertical row and:

- say the sounds aloud, slowly, registering their inner physical movements;
- whisper the sounds;
- adopt the tongue postures, but without sound or exhalation.

2 Take symbols at random and say the corresponding sound both aloud and whispered.

3 Close your eyes or look away and think of monophthongs at random. Find the tongue posture, notice it, whisper and voice the sound. Then look back at the chart and locate the sound.

4 Look away and visualize the monophthong section of the chart in your mind's eye. Start anywhere. Visualize the symbol. Can you hear the sound in your mind's ear? And can you link that to a sensation of the muscular movement?

Schwa: a note on a special sound

The central vowel /ə/ can claim to be the 'smallest' English vowel sound and yet it is the only phoneme with its own name. It is by far the most frequent vowel sound in continuous speech, though it never carries stress. It is its unstressed nature that contrasts with stressed vowels to contribute to the rhythmical nature of English. ('You can't have stress without unstress' – more on this in Level 2 of the discovery toolkit.) Its correct use is crucial to the smooth rhythmic quality of spoken English. /ɜ:/ is its longer, stressed equivalent.

Discovery activity 9 Sensitivity to jaw position

Place your forefinger on the bridge of your nose and the thumb of the same hand on the point of your chin. Say /i:/ and glide slowly to /æ/. Notice the downward movement of your jaw indicated by the increased distance between thumb and forefinger.

Try the movement /i: ... æ ... i: ... æ ... / several times both aloud and whispering to confirm the link between tongue lowering and jaw opening. Try the same activity with the other three vertical columns of monophthongs /ɪ/ to /ʌ/, /ʊ/ to /ɑ:/ and /u:/ to /ɒ/.

Commentary ■ ■ ■

This illustrates that jaw position and tongue position are interlinked, so that when the tongue is relatively high or close to the roof of the mouth the jaw is usually relatively closed, while when the tongue is low the jaw is usually relatively open. This makes good mechanical sense as a more open jaw enables the tongue to move further (lower) from the roof of the mouth.

In some systems of vowel description the terms 'close–open', referring to jaw position, are used in place of the terms 'high–low', referring to tongue position. On the monophthong section of the phonemic chart, jaw position could be indicated as in Fig. 10. ■

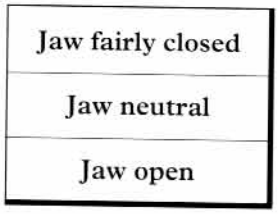

Fig. 10: Jaw positions for monophthongs

Discovery activity 10 High–low and close–open

In connected speech some speakers tend to use fairly minimal jaw movement while still producing the required vowel sounds. It will be helpful later to have experience of this.

Say a high vowel aloud, and glide to its opposite low vowel without opening your jaw any further. You may find that you can lower the tongue sufficiently to approximate the open sound without actually opening the jaw, though it probably sounds a little strangled.

Commentary ■ ■ ■

Now try it the other way: say the open vowels and try to glide towards the closed vowels by raising your tongue while keeping your jaw open. Not so easy is it! But store this experience in your memory for future use when working with learners who need to co-ordinate tongue and jaw movement. ■

Energy in the jaw

Another relevant aspect relating to the jaw is the energy stored and released there during the articulation of vowels. The setting of the jaw muscles for English is characteristically less tense than for some other languages (French, German, Italian, Spanish, for example).

Discovery activity 11 Energy and tension in the jaw muscles

Take monophthongs at random, and try increasing and decreasing the amount of energy you use in the jaw postures and movements. What do you change? How do you do this? What is the internal sensation? Does this provide any insight into your learners' difficulties?

Say a sentence in English and concentrate on the movement of your jaw. Try to register the sensation of tension and energy. Try the same experiment in another language. What do you notice? What implications could this have for your learners?

Commentary ■ ■ ■

So the relaxation or tension of jaw muscles provides another 'hook' for the development of awareness, and a variable that can help in 'getting the feel' of a language. ■

Lip position

We have been investigating the way in which the posture of the tongue affects the resonant space in the mouth. The lips can further modify the size and shape of the resonating space, and provide a kind of acoustic tuning to the fundamental vowel sound produced by the tongue position. Lip movement is easier to detect visually, and for many people easier to sense internally than the movement of the tongue.

In the following activities you can enhance your awareness of what you are doing:

- through the internal sensation of muscle tension and release in your lips;
- through your external sense of touch, using your fingers as described;
- through visual observation of your lips using a small mirror.

Discovery activity 12 Lip position

1 Say the sound /ɜ:/ as in *sir*, and notice the position and shape of your lips. They should be relaxed and in a neutral position. If you detect any tension in lips, tongue or jaw, then try to let go. This lip posture is characteristic of English vowels where the tongue is in a central position.

2 Say /i:/ as in *me*. You'll notice that the lips spread, with some muscular tension, as if towards a half smile. This lip posture is characteristic of English vowels where the tongue is in a high–front position. Now exaggerate the lip position into a full smile, noticing the change in internal sensation, and in the sound produced.

3 Say /u:/ as in *too*. You'll find that your lips become rounded, as if towards a whistling position. Notice the internal sensation of the muscle tone. This lip posture is characteristic of English vowels where the tongue is in a high–back position. Try exaggerating the lip position by rounding them more tightly and pushing them further forward. Notice the different sound linked to the different muscular sensation.

4 Say /æ/ as in *sad*. Your lips should be open and spread. This lip posture is characteristic of English vowels where the tongue is in a low–front position.

5 Say /ɔ:/ as in *door*. The rounding of your lips is probably not as tight or as forward as for /u:/ but nevertheless very obvious, and helps to obtain the right sound. Notice the contrast in this vowel position between the forward posture of the lips and the back posture of the tongue. This lip posture is characteristic of English vowels where the tongue is in a mid–back position.

6 Now try these activities again, but this time:

- whispering the vowel. Your ear still picks up the unvoiced characteristics of the vowel which you can relate to lip positions;
- silently. Removing the sound entirely may help you attend more fully to the internal sensation of muscle tone in your lips;
- using a mirror to compare the visual movement of your lips with the internal sensation of movement.

Commentary ■ ■ ■

Try to make the connection between the sensation of the lip muscles in different positions and the effect on the sounds that you hear. It's important to become sensitive to all the visual clues of pronunciation, because they will help you to know what your learners are trying to do, which in turn will help you to help them. See if you can relate your own lip positions in discovery activity 12 to the examples shown in Fig. 11. ■

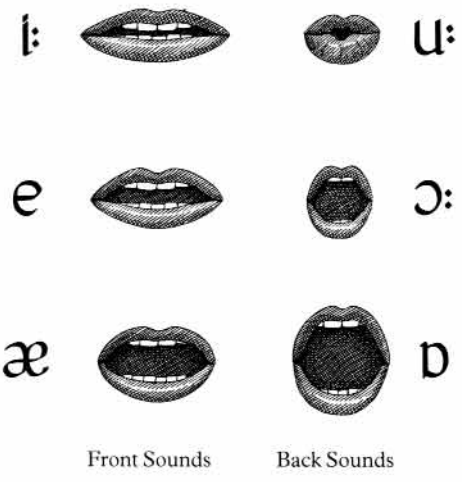

Fig. 11: Examples of lip positions for front and back vowels

Discovery activity 13 Lip rounding and spreading

1 Start with the sound /iː/. Touch the tip of your thumb gently against one corner of your lips, and the tip of your forefinger against the other corner. Now change /iː/ very gradually to the sound /uː/. Slowly alternate /iː ... uː ... iː ... uː ... / letting thumb and forefinger follow the movement of your lips. This should tell you that your lips are alternating between spread and rounded. Now exaggerate the lip movement. Notice the internal sensation.

2 Using your fingers in the same way, what lip rounding and spreading can you detect when moving between these pairs?

/e ... ɔː ... e ... ɔː ... /
/æ ... ɒ ... æ ... ɒ ... /

Commentary ■ ■ ■

The aim of this activity is to sharpen the sensation of lip rounding and spreading by providing external tactile evidence. ■

Discovery activity 14 Forward and backward lip movement

1 Start with the sound /iː/. Touch your forefinger lightly against the front of your lips. Now change /iː/ very gradually to the sound /uː/. Slowly alternate /iː ... uː ... iː ... uː ... / while maintaining contact between finger and lips. You should get a clear indication that your lips are moving forward when rounded and backward when spread.

2 Try the same thing with these pairs:

/e ... ɔ: ... e ... ɔ: ... /
/æ ... ɒ ... æ ... ɒ ... /

3 Try the same activities silently, attending to the sensation of lip movement on its own.

Commentary ■ ■ ■

This activity is intended to illustrate that forward movement of the lips is part of the lip-rounding movement, and that backward movement of the lips is part of the lip-spreading movement. Fig. 12 contains this information.

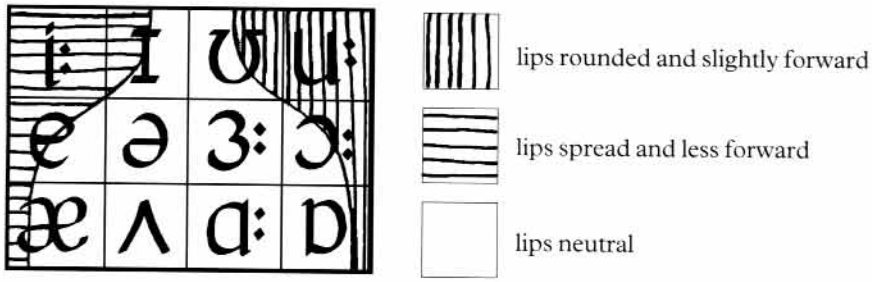

Fig. 12: Lip position superimposed on the monophthong chart

However, the correspondence between back vowels and rounded lips, and between front vowels and spread lips, is not necessarily a tendency in other languages. Now that you can change tongue position and lip position independently and at will, you can also try producing front vowels with lips rounded and back vowels with lips spread. This results in interesting non-English sounds, and gives further insights into difficulties some learners may have and how to help them. The next discovery activity goes into this. ■

Discovery activity 15 Doing the 'opposite' lip movements

This activity involves doing the opposite of what is indicated in Fig. 12.

1 Say /i:/ with the lips spread as usual, but then round your lips while holding the tongue position constant. What happens? First the posture may feel awkward and unfamiliar (if English is your mother tongue), and second you probably get a sound you recognize from several other languages (including French, Swedish, and German, but not English). What you have is the non-English combination of forward tongue with forward, rounded lips. This is a good illustration of how the lip position can fine-tune the resonating space created by the tongue to make up the overall sound.

2 Try the corresponding activity. Say /i:/ with the lips spread as usual, and then hold the lip position constant while moving the tongue back in the mouth towards /u:/. Think /i:/ with your lips and /u:/ with your tongue, and what do you get?

3 Say /e/, and holding the tongue position constant gradually round your lips. How does that alter the sound? Try the same with /æ/.

4 Say /e/, and hold your lip position constant while moving your tongue back. Notice the resulting rather nondescript vowel sound. Try the same with /æ/.

5 Try the following activities, and notice the non-English vowels you invent:

- Say /u:/, hold the lips constant and move the tongue forward.
- Say /u:/, hold the tongue constant while you spread the lips.
- Say /ɔ:/, hold the lips constant and move the tongue forward.
- Say /ɔ:/, hold the tongue constant while you spread the lips.
- Say /ɒ/, hold the lips constant and move the tongue forward.
- Say /ɒ/, hold the tongue constant while you spread the lips.

Try these aloud, whispered, and silently.

Commentary ■ ■ ■

Perhaps these activities have reminded you of some of the attempts by your learners to get round a new sound. If we as teachers can be aware of these variables within ourselves, we will be in a better position to understand and help our learners to find sounds that are unfamiliar to them. ■

Vowel length

Vowel length is a fourth variable which is used to describe monophthongs, and it is rather different from the first three. To clarify this difference here's a summary of the story so far:

Vowels get their characteristic sound quality from the shape and size of the resonant space in the mouth, and this resonant space is determined by:

- the horizontal tongue position (front–centre–back);
- the vertical tongue position (high–mid–low); and
- the lip position (rounded–neutral–spread).

Each of these variables affects the acoustic quality of the sound itself, while the fourth variable, vowel length, concerns not the quality, but the quantity, or length, or duration of the monophthong.

Discovery activity 16 Making monophthongs longer or shorter

Look at the monophthong section and say each vowel:

1 as you normally say it;
2 making it last longer than usual, though not changing the quality of the sound;
3 giving it the briefest duration you can, but not changing the quality of the sound.

iː	ɪ	ʊ	uː
e	ə	ɜː	ɔː
æ	ʌ	ɑː	ɒ

Fig. 13: Monophthong section

Commentary ■ ■ ■

Are there any which seem more 'comfortable' when short, or when long? You may find that some vowels are easier to lengthen or shorten, and that you have distorted the quality of others. This may relate to habitual associations you make between certain tongue postures and length, and other postures and brevity. ■

Discovery activity 17 Five long vowels

In English there are five vowels usually designated as being relatively longer than the others, and these are indicated by a length mark (a colon) after the symbol. They are /iː, uː, ɜː, ɔː, ɑː/.

Say them aloud, and note your subjective feel for the length of each of them as said in isolation. Do the ones with length markers /iː, uː, ɜː, ɔː, ɑː/ in fact seem to you relatively longer?

Commentary ■ ■ ■

Two points to note about length:

1 English vowels are traditionally referred to as long or short. A long vowel tends to have a longer duration than a short vowel in the same context. But length is not an absolute attribute of any vowel.

2 A second point to note is that length is not the only thing that distinguishes long vowels from short ones. Monophthongs differ from each other in the quality of the sound regardless of whether they are longer or shorter. ■

Discovery activity 18 Length in identical contexts

Say these words several times over. Ignore the difference in the quality of the vowels and try simply to observe the length of each vowel compared to the others. The consonants are identical in each case in order to make it easier to compare the vowels:

/hiːt/	heat
/hɪt/	hit
/huːt/	hoot
/hʌt/	hut
/hɑːt/	heart
/hɒt/	hot
/hɜːt/	hurt

Commentary ■ ■ ■

What you should find is that on the whole the vowels with length marks are longer than the others. If you don't notice this it could either be that you are not making any difference in length, or that you are making the difference but you do not notice it. In either case don't despair, but try the next activity! ■