

Planning a minimum number of key questions will also allow you the flexibility to adapt questions, or spontaneously develop new ones in response to student comments, without losing sight of your objectives.

In planning your key questions we suggest that they should be:

- matched to the content or process which you wish to develop
- a mix of fact and higher cognitive level questions
- sequenced in logical order
- clear and suited to the level of the students
- answered according to a consistent procedure.

Plan Questions which are Matched to the Main Points You Wish to Develop

Note the main facts, concepts and generalisations, then draft your key questions to elicit these facts, concepts and generalisations from the students. Avoid focusing your questions on trivial facts that do not reflect the thrust of the material which you wish to cover.

Plan Some Higher Cognitive Level Questions

Questions are usually divided into two broad categories: fact and higher cognitive level. This division is based on Bloom's taxonomy of cognitive learning which we discussed in Chapter 3. Fact questions equate to the knowledge level and involve the recall of information. An example of a fact question is: "What does an anthropologist do?"

Higher cognitive level questions are drawn from one of the other five levels of the taxonomy—comprehension, application, analysis, synthesis and evaluation. A higher cognitive level question involves some independent thinking by students; the amount will vary according to the match with the taxonomy. Here are some examples of higher cognitive level questions from Steve's lesson on the Bushmen of the Kalahari. This lesson is described on pages 172–179.

1. In what ways would a Bushman's food differ from our food? (comprehension)
2. Can you demonstrate how a Bushman would use a bow and arrow? (application)
3. From the evidence shown on the map, what sort of land—hot, wet or dry—do you think the Bushmen live in? Give me a reason for your answer. (analysis)
4. Draw a map of a Bushman's camp to show shelter, food, water and recreation? (synthesis)
5. If you had a choice of being a man, woman, boy or girl in a band of Bushmen, what choice would you make? Why? (evaluation)

QUESTIONING AND RESPONDING

Teachers spend a considerable amount of time planning and asking questions and responding to answers. Research shows that teachers can ask up to several hundred questions per day. (Gall, 1970; 1984). The purpose of these questions, among other things, is to arouse interest, summarise major points, encourage discussion, stimulate higher cognitive level thinking, check on class progress, routines and behaviours, maintain attention and evaluate learning.

Effective questioning and responding to answers are two of the most difficult skills in teaching. Because of this difficulty we are dividing our discussion into two sections—basic and advanced questioning. In Chapter 17 we will consider advanced questioning skills and in this present chapter we will outline four basic sub-skills in questioning and responding:

- Planning questions
- Asking questions
- Responding to answers
- Getting students to ask more questions

Planning Questions

In order to develop your questioning skills during teaching practice you should plan four or five key questions for lessons which depend upon questioning for success. This planning will give you confidence and take the pressure off you when asking questions and responding to answers. Planning your key questions will also facilitate lesson flow and help you cover the main points at a level appropriate to the students.

In addition to fact and higher cognitive level questions, teachers also ask procedural questions which relate to the management of the lesson. For example: "Bill and Anna, can you please distribute the maps for me?"

According to Call (1970; 1984), about 60% of all teacher questions are fact questions. Of the remaining 40%, 20% are higher cognitive level and 20% procedural. A procedural question is one which is related to the routines or procedures to be followed when doing a task.

In planning your questions, you should generally aim to include some higher cognitive level questions—perhaps, depending upon the students and the lesson, as many as half the total number. Also, when planning your higher cognitive level questions, you should consider the kinds of responses which students might give. This will help you think on your feet during the lesson and make adaptation to student responses much easier. It will also ensure that your questioning doesn't degenerate into a process referred to by a colleague of ours as "guess what answer is in the teacher's head".

Sequence Your Questions

In addition to including a number of higher cognitive level questions in your planning, you should also sequence them in order of difficulty. Thus it is a good idea to start with fact questions and gradually introduce higher cognitive level questions of increasing difficulty. This gives every student the opportunity to achieve success.

Check that Key Questions are Clear and Suited to the Level of the Students

Once you have drafted your key questions, check, that they are appropriate to the level and ability of students. Make sure that they are not ambiguous and are phrased in simple, concise language so as to assist comprehension. For example, "If you look at the map, what kinds of shelter can you see on it?"

Decide on the Procedure for Responding

During teaching practice the procedure for responding to questions will probably be part of the class routines. Nevertheless, you will want to be sure of your expectations in this regard. The most common procedure for responding to questions is:

1. Ask the question
2. Say, 'hands up'
3. Pause
4. Select the answer from a student with his/her hand up. If there is a call-out, ignore it.
5. Pause
6. Listen to the answer
7. Comment/praise.

If this is the procedure followed by your practice teacher then you would be wise to adhere to it. Other procedures for responding to questions include written answers, demonstrations and chorus responses. A chorus response is not a call out, rather it is a means of involving all students in a unison response to a knowledge type question. For example, $6 \times 9 =$ (answer altogether). With small groups, the procedure for responding might be informal with students answering without raising their hands. Whether this is acceptable to you will really be a matter of preference and judgement. Whatever procedure you decide to adopt, it is most important that you make your expectations clear to the students. Otherwise, control problems will develop.

ACTIVITY 5.5

During his final teaching practice, Steve used the newspaper with his split Grade 6/7 class to develop their general knowledge. His current affairs sessions were a highlight of each day. Part of the format for these sessions was to run a radio station with news flashes of items of current interest. The idea was that a student presented an item from the newspaper and Steve followed up, in a Mastermind format, with some fact and higher cognitive level questions. Other students also framed and asked questions for the presenter to answer.

Assume you are going to run a similar session in your class. Select a newspaper item and draft a series of appropriate fact and higher cognitive level questions for it. The verbs listed for the cognitive domain in Chapter 3 should prove helpful.

Now present your item to a small group. Try as much as possible to keep to your planned questions but also shape and supplement them to accord with responses and discussion points. When your have completed your presentation use the checklists in Chapter 17 to obtain feedback from the group about your questioning and responding.

Asking Questions

In asking questions during lessons you should keep the suggestions we have made about planning questions firmly in mind. To help you recall the questions you have planned, write them on a palm card and refer to it during the lesson.

We would also suggest that you:

- ask questions in an encouraging manner
- direct questions
- redirect questions
- distribute questions
- wait, before asking for an answer
- ask one question at a time
- avoid rhetorical questions.

Ask Questions in an Encouraging Manner

In order to encourage answers, it is essential that you appear interested and ask your questions in a brisk, warm and friendly manner. Non-verbal mannerisms such as a smile or a nod will help encourage students to feel at ease and respond positively to your questions.

Direct Questions

Generally you should also direct your questions to the whole class, wait for a positive response (hands up), and then name a specific student to answer. This helps involve all students in thinking about the question and reduces the probability of call-outs. Call-outs should be avoided for they stop students from thinking about the questions, prevent you from directing or structuring the discussion and may lead to control problems.

A good example of correctly directing a question is:

"If you look at the map what sorts of shelter can you see there?"

(Pause, hands up)

"Sue."

A poor example of directing a question is:

"Now I wonder what they used the bush hats for? Anyone any ideas?"

(Students call out—sleeping, eating, resting.)

Sometimes teachers name the student to answer the question before asking the question. For example: "Shelley, can you guess who these people are?"

This has the advantage of bringing Shelley into the lesson by keeping her alert. However, it can also be a signal to the other students that they don't have to answer the question—and hence there is no need to think about it. For this reason, it is generally best to direct the question to the whole class, then name a student to respond.

Redirect Questions

Many teachers are very good at redirecting questions. This means that several students are given the chance to answer the same question. For example, in Steve's lesson on the Bushmen, he redirected this question:

Steve: Because it was a heavily tramped area, what might that tell us about these people?

Sarah: They could dance around the campfire.

Steve: ... (comment)

Gary: It could be a well-used campfire.

Rob: They could sleep around the campfire.

Steve: ... (comment)

Anna: Well they could walk around while they were cooking.

Redirecting questions leads to a greater degree of student involvement, increases the range of answers and reduces teacher talk.

Distribute Questions

Research indicates that, as a general rule, questions are not equally distributed among students. Many teachers have an "action zone" across the front row and up the centre of the room and questions tend to be distributed in this area. (Adams & Biddle, 1970). Moreover, low-achievers receive fewer questions than high-achievers. (Good and Brophy, 1997). To avoid these problems, try to make a point of distributing your questions evenly around the class. This means that you might have to make a mental note to ask questions across the back and along the sides of the room. During teaching practice it is a good idea to ask your teacher to draw a plan of the class seating arrangements and record the positions to which you direct questions. This will tell you a lot about your distribution of questions—and your "action zone"!

Wait, Before Asking for an Answer

After you ask a question, wait before requesting an answer. The length of the wait will depend on the difficulty of the question and the readiness of the students to respond. With fact or drill questions this pause may be quite brief. With higher cognitive level questions try to wait a little longer, perhaps for up to 3 seconds. Name the student to answer the question and then wait briefly again for the response. A nod or smile is often helpful in encouraging a student to give a thoughtful response. In general, research tells us that when teachers wait for answers the responses will be longer and more varied, with a higher rate of student involvement (Rowe, 1974, 1986; Tobin 1987). So, hard as it may be, try to wait before rushing in to obtain an answer—it will be worth it.

Ask One Question at a Time

Sometimes, student-teachers like Steve are so anxious to get an answer that they do not give the students time to respond before re-phrasing or repeating the question. For example:

"And now you might say, what did they use the bush shelter for?
Why would they need bush shelters?"

This is a poor habit to get into for it trains students not to listen the first time a question is asked. A related behaviour is to ask more than one question at a time. For example:

"Can you tell me how the Bushmen cook? Where do they get their water from?"

This type of questioning only results in confusion for students and should be avoided during teaching practice. No matter how unsure you feel about your questioning, work hard on asking one question at a time and wait for an answer. If after 3 to 5 seconds an answer is not forthcoming, reformulate the question in simpler terms.

Avoid Rhetorical Questions

Rhetorical questions are questions for which the teacher does not expect an answer or supplies the answer. Two examples from Steve's lesson on the Bushmen are:

"Have you all got the map there? Okay? Right?"

and

"What do the symbols on the map mean? Well we've got a tree, we've got an open fire, we've got bones and animal scraps, we've got flat stones, we've got nut shells, we've got melons and we've got a heavily tramped area."

Rhetorical questions should be avoided for they are not only irritating but they negate against student involvement in the lesson.

Responding to Answers

In responding to student answers there are several points that you should follow:

- do not respond to random call-outs
- respond positively to answers
- develop answers
- assist with hints and clues
- correct incorrect answers.

Do Not Respond to Random Call-outs

Should students randomly call out answers it is generally best not to respond as this will encourage repetition of the call-out. By responding to a call-out you are reinforcing a behaviour that can be disruptive and one that certainly interferes with you getting high quality answers. So insist that students respond in the manner you have planned, whether it be by a show of hands or some other technique.

A note of encouragement: If there are a lot of call-outs, ignoring will make them get worse—before they get better. But they will get better if you praise the attention-seekers (who call out) for behaviours that are acceptable, and consistently follow the pattern outlined above.

Acknowledge Correct Answers

As a general rule, correct answers should be acknowledged as they confirm to all students that the response was correct. Perhaps the only exception to this is in a fast-paced drill session where it is understood that responses are correct unless the teacher says otherwise. Confirmation of a correct answer may take the form of non-verbal behaviour, such as a nod or a smile, a verbal confirmatory comment such as "right", some praise (see Chapter 13) or a discussion and extension of the answer.

Develop Answers

Although it is difficult, highly effective questioners are able to develop student answers and incorporate them into the lesson. They pause, then comment on, and extend answers to form the basis for the next question. In doing this, though, they make sure that they do not repeat student answers unnecessarily. Repetition of answers devalues the student's answer, wastes time and leads to students not listening to each other's answers (tune-out time). Rather, good questioners follow up and build on student answers. In turn this building on student answers shows the class that their answers are valued and are an important part of the learning process. It is also a very powerful form of feedback to the student who has contributed the answer.

Assist with Hints and Clues

If a student or a class is having difficulty in answering a question, do not be afraid to rephrase the question or change it around to make it easier. Sometimes if a student is struggling to answer a question, or has momentarily forgotten the answer, a clue or hint from you may be all that is needed to get a correct response. This will give success to the student and keep the lesson moving.

If a response is partially correct then the correct part should be acknowledged and the question rephrased, or hints and clues given to elicit a response. If a response is not forthcoming then provide the answer or ask another student (Brophy & Good, 1986).

In giving hints and clues, *watch out for the trap of answering your own question*. It can become a habit!

Correct Incorrect Answers

If rephrasing a question or giving hints and clues does not lead to an improved response then it is often difficult to know how to proceed. Our preference is to matter-of-factly give the student the correct answer and, if appropriate, to add an explanation as to why the answer is correct. Then return to the student with the same question a little later on in the lesson in order to give the opportunity of answering it correctly. Acknowledge the correct response in a natural and encouraging way.

An alternative is to direct the unanswered question to another student in the class. This approach is favoured by many teachers but we wonder about its effect on students' self-esteem, especially when the student who gave the incorrect answer is put down by the other students and ignored by the teacher.

Getting Students to Ask Questions

In this chapter we have considered teacher questions. However, you should never forget that students' questions are just as important, if not more important. Yet research tells us that students ask fewer than 5% of class questions (Gall, 1970, p. 716). How can we get students to ask more questions?

Here are seven ways in which you could encourage students to ask questions on your next teaching practice:

- Pause after making a presentation to the students
- Ask, "Are there any questions?"
- Be available for students to talk to you in out-of-class time
- Use teaching strategies that involve questioning (e.g., cooperative learning)
- Set up a Question Box in the class
- Encourage students to question one another
- Respond to student questions in an interested and encouraging manner.

There is an old Cameroonian proverb that says: "The person who asks questions cannot avoid the answers." And that reminds us, if you don't know the answer to a student's question, then say so, and arrange to find out.

SELECTING AND USING INSTRUCTIONAL RESOURCES

In helping you prepare for teaching practice and your career in teaching we have emphasised the importance of facilitating student learning and development at all times. In order to do this, effective teachers base their work on careful planning, positive teacher-student relationships and effective presentation skills. Learning experiences are designed to begin and conclude meaningfully. Information is presented in an interesting, logical way, and the students' grasp of this information is monitored by judicious questioning and responding to students' contributions. Teachers can be assisted in presenting information in an effective and interesting way through the thoughtful selection and use of resources. Some of the many resources available to teachers are: study prints, information sheets, chalk/whiteboard, radio broadcasts, charts, pictures, posters, audio recordings, diagrams, worksheets, video, filmstrips, slides, television broadcasts, maps, models, computer software, interactive video, books, overhead projector, graphs, sound slide sets, sound filmstrips, magnetic boards, photographs, overhead transparencies, newspaper, magazines, film, newspapers, felt boards, and learning laboratories.

Importance of Instructional Resources

Selecting and using appropriate resources to communicate information is a very important part of the teacher's task. This is not only because instructional resources such as television, videos, radio, audio cassettes and computers are widely used in classrooms but also because they can enhance learning if used appropriately (Clark & Salomon, 1986; Kemp & Smelhe, 1989). For example, instructional resources can help students learn more effectively by:

- helping to gain and maintain interest in a lesson
- encouraging mental involvement and the use of different senses while learning
- making learning more meaningful by linking in with previous knowledge and/or providing organising structures which give abstract ideas a concrete form or representation
- catering for students who learn best through different senses—for example, some students learn best through listening, while others learn best through seeing, touching, tasting, or a combination of these four ways
- reinforcing, integrating and extending classroom instruction
- helping in the recall of information
- making explanations of difficult concepts and skills clearer
- providing immediate feedback and knowledge of results
- encouraging independent learning.

Potential Limitations of Instructional Resources

While the judicious use of instructional resources can enhance learning in a number of ways, it is also important to note some potential limitations. The first potential limitation is that the effectiveness of the resource very much depends on whether it is suitable for the knowledge or skill to be learned and the attitude of the students. The students' attitude may be influenced by such factors as prior knowledge, the way they construct knowledge (see Chapter 1), feeling toward the resource and/or the difficulty level of the material. On this basis, instructional resources should mainly be seen as a means of support for the achievement of learning objectives in a particular lesson. It is this facilitative function of instructional resources which should be emphasised during teaching practice. The second potential limitation relates to the technical aspect of using instructional resources. This might involve the faulty use, or malfunctioning, of a piece of equipment. A third potential limitation relates to the inappropriate selection and use of instructional resources. This might involve poor decision-making in terms of matching the resource to any one of the following factors: the background of the class/lesson, the learning objectives, the subject matter, the learning experiences and the procedures for evaluation. An example of an inappropriate selection of a resource is the use of a favourite resource, such as a video, which does not really fit in with the objectives of the lesson or with the purpose for which it was produced. A further example is when too many resources are used in a lesson and students become confused over the learning.

General Guidelines for Selecting and Using Instructional Resources

To help you avoid these problems and make the best possible use of instructional resources in your teaching we will present some general guidelines for selecting and using instructional resources. We will also consider ways of specifically selecting and using the following resources:

- Visual:**
- The chalk/whiteboard
 - Worksheets
 - Print material
 - The overhead projector
 - Pictures
 - Charts, maps, illustrations, diagrams and graphs
 - Models
- Audio-visual:**
- Slides and filmstrips
 - Film, television and videotapes
- Audio:**
- Radio
 - Cassette tape
- The Computer**

Instructional resources should be selected on the basis of whether they are suitable for the learning task you have in mind. There is no single resource suitable for all purposes. Being clear on what resource best suits your purpose is important. In making this decision you should be guided by the planning model we discussed in Chapter 3 and consider background factors, learning objectives, subject matter, learning experiences, and evaluation.

Background Factors

- To maximise the impact of a resource give careful consideration to selecting a resource suitable to the situation. For example, if students in a wheatbelt area are studying aspects of a rain forest environment, it would not be feasible to visit a rain forest area. The best alternative might be the viewing of and discussion of a film on the Amazon region or a video on the Daintree Forest in Queensland. Film or video would show the rain falling, the run-off feeding into a river and so on, aspects that cannot be demonstrated in still pictures like slides, filmstrips, study prints or posters. Of course, if the students happened to be in a school near a rain forest then the real experience is well within their reach and an excursion would be the best resource to use.

A further example of appropriate resource selection would be where the students are learning about composition and the instruments of an orchestra. The real experience of an orchestral concert would provide the initial aural and visual stimuli. In a follow-up to the concert, learning could be reinforced by using an overhead transparency that shows the relative position of the players. Consolidation of this learning could be effected by a challenging worksheet activity.

- Ensure that your instructional resources are appropriate for the age, abilities, knowledge and interests of the students. If you are selecting print materials then the reading level should be matched to the ability of the students.
- Check the amount of time you have for the lesson and determine whether the resource you have in mind will be appropriate. For example, you may wish to show a 20 minute video in a 30 minute lesson. In such a case you would not have time to introduce and discuss the video so an alternative decision would need to be made.
- Check the class size. The resources you use in a whole class setting may well differ to the kind of resources used in a small group setting. For example, the use of three-dimensional models will be easier in a small group situation than a whole class setting.
- Check the availability of resource materials. This might include checking the library and the resource centre at your college or university. It should certainly include a careful inspection of your school library and resource centre. In

special circumstances material can also be obtained from central lending organisations such as departmental resource centres, museums, local libraries, and other appropriate organisations. Students may also bring in resources for units of work.

Learning Objectives

- Resources must also fit in with your learning objectives. Resources are a means—and only a means—toward achieving these objectives.

Subject Matter

- Preview carefully before you select an instructional resource. In addition to checking the above points, note any evidence of out-of-date material, inaccurate content, and/or cultural, gender or political bias. Determine whether you will use, reject, or explain carefully to students the limitations of the material.

Learning Experiences

- Prepare thoroughly—make sure that you are familiar with the resource so that you use it with confidence and assurance. If equipment is involved, check that it is in working order, make sure that you know how to operate it and that it is available when required.
- Be very selective about the number of resources that you use in a lesson. The use of too many resources can overwhelm and confuse students.
- Use the resource at the right place and time in the lesson. The resource should fit in with the flow and sequence of the lesson. It should serve a definite teaching purpose and be but one part of the lesson.
- Should the resource be radio, film, video or television, introduce the programme by outlining the content. You might also set some questions to guide listening or viewing.
- Follow-up after using the instructional resource. In the preceding guideline this means discussing the questions and drawing appropriate conclusions from them. Other ways of following up on resource use are through exposition, discussion, student demonstration and set activities.
- Encourage students to use instructional resources. They should be taught (age permitting) how to operate resources such as cassettes and overhead projectors. This will facilitate student involvement in lessons and act as a time-saving device for the teacher. Students should also be encouraged to use resources in presenting their work to the class and teacher.

Evaluation

- Evaluate the effectiveness of the resource. This might flow from the follow-up to the lesson and from your observations during the lesson or a test. Student and teacher self-evaluations can also be a useful means of ascertaining whether the resource was effective/ineffective.
- Do not assume the resource will do the teaching for you. It may well be that after your evaluation you will have to re-teach the material. Be prepared for this.

Specific Ways of Selecting and Using Types of Resources

The Chalk/Whiteboard

Although you will have a great variety of modern resources available to you for use in the classroom, the old fashioned chalk/whiteboard is still the most valuable aid. It can be used:

- to display instructions, rosters, timetables
- to present copies of work exercises
- to demonstrate important teaching points
- to summarise key teaching points
- for reminders and homework assignments
- to model work standards
- by students as a reward for work completed—or as an alternative work place.

In using the chalk/whiteboard there are some well tried hints which you should find useful. These are:

- Your chalk/whiteboard should provide a model of the standards you expect from your students. Whether it is a good or bad model will certainly be reflected in the work of the students. Therefore, letters, figures and illustrations should be formed neatly and correctly.

In developing good board work you should hold the chalk across your fingers from the top of the forefinger to about the first joint of the little finger and hold with the tip of your thumb. Do not hold the chalk like a pen or pencil. As you write try to keep finger and wrist joints stationary and use large movements of the whole forearm. Printing or writing must be large enough (about 3cm high) to be legible from the back of the room. The use of coloured chalk can enhance chalkboard work but care must be taken to use colours which can be easily read from all sections of the room.

Try to write in a straight line. Moving from left to right with the chalk or marker ("walking with the chalk") will help you do this. Another commonly used technique is to rule temporary guide lines on the chalkboard with the top of a pencil eraser. In your own classroom more permanent guide lines can be ruled with a texta.

1. In presenting a map or an illustration you can be assisted through the use of the overhead projector. An image of an object can be projected onto the board and lined around. A variation of this is to trace or photocopy a map or an illustration onto an overhead transparency, project it on to the board and line around it. Should you wish to develop the illustration during the lesson use the same technique but instead of outlining in full before the lesson, lightly dot your outline and then complete it with your explanation. The students will be impressed! An old fashioned version of this technique was to take a brown paper copy of a map with holes along the outline. The map was held against the board and tapped with a duster. A dotted line of chalk dust showed the outline on the board and during the lesson it was lined over. Try it sometime!
2. A great deal of your chalk/whiteboard work—work exercises, instructions, maps, diagrams—should be completed before the students enter the classroom. When students are engaged on learning activities you should be supervising, not ignoring them while you write on the board.
3. For some of your chalk/whiteboard entries—demonstration of, or progressive summaries of teaching points—you should use the board as you teach.
4. Try to establish a more-or-less permanent organisation and setting out. Students should know where to find instructions, work exercises and so on.
5. Avoid overloading your chalk/whiteboard. A board which is crowded can be confusing and frustrating for the students. It is a good idea to start each lesson with a clean board.
6. It is often necessary to cover some of the work you have prepared on the board. An added benefit is that this can stimulate interest.
7. An essential ingredient for the development of skill in the use of the chalk/whiteboard is *practice*. As a student on teaching practice, use non-contact time to practice your chalk/whiteboard presentation. If you are left-handed, writing on the board can be difficult. However, with practice you can make this a strength area. How? Practice writing with your right hand as well. Then when you come to write on the chalk/whiteboard in class you can start with your left hand and change to your right hand. A definite attention getter!

Worksheets

During teaching practice you will most likely observe teachers using worksheets or activity sheets. It is probable that you will also have to use them. In order to use worksheets effectively you must be able to justify to yourself that they fulfil a learning need. Unfortunately there is a tendency to use worksheets as a fill-in or busy work activity with little or no teacher supervision. Each worksheet should have a clear purpose and be designed to introduce, apply or consolidate knowledge or a skill.

Worksheets need to be structured carefully. They must relate closely to the learning which has just been covered in the lesson, with some development or extension beyond the initial learning. In addition, you should note that:

1. Worksheets should be written in simple language that can be understood by each student.
2. They should contain key instructions and directions so that the activity can be carried out by the students.
3. Questions and examples should be sequentially graded. Items should progress in order of difficulty.
4. There should be a limited number of questions and examples in order to give each student a realistic expectation of completing the activity. Ten items should be sufficient.
5. Worksheets should be presented in a challenging and attractive manner. This means they should arouse interest, be carefully arranged with sufficient space for answers, reflect correct spelling and letter formation and, where appropriate, contain a picture to reinforce the major learning point.
6. Worksheet presentation can be considerably enhanced by using appropriate computer software packages.

ACTIVITY 5.6

1. Add interest to your worksheets through better lettering. Complete the following worksheet and watch your lettering improve!

LETTERING

MUST BE
* EASILY READ
* CORRECTLY FORMED
* NEATLY DONE

DO NOT MIX CAPITALS WITH LOWER CASE LETTERS

A variety of styles will create interest
Use different sizes of letters
Try positive/negative backgrounds

photocopy, trace, cut and paste, use a typewriter

① ② Copy this letter, then do another in the same style.

③ ④ Make a word using this style of lettering.

A

B

S

H

M

2. Look again at the worksheet on lettering. What are two strengths and two shortcomings in the construction of the worksheet?
3. Prepare a worksheet for the following examples of subtraction with a Grade 5. Make it as interesting and challenging as you can.

8000	7436	7935	4864	5678	8325	4345
-3657	-5687	-2416	-2492	-3435	-4167	-3596

Print Materials

During teaching practice the most common form of print materials that you will use are textbooks/reading books. The range and variety of books will depend upon school policy and the teacher's preference. Other print materials that you can use on teaching practice are reference books, pamphlets, leaflets and newspapers. The newspaper is an excellent resource because, with imagination, it can be used in all subject areas. Furthermore, the newspaper has a touch of immediacy and relevance about it. In addition you should note that:

1. Print materials should only form part of the lesson. A lesson should never start with: "Take out your books and open them at page... Now let's look at the first example." The reason for this is that more effective learning results from an interesting and structured introduction followed by sound developmental activities and a purposeful conclusion.
2. If developmental activities are to be based upon a text then you should check very carefully that the activity is matched to the students' level of ability. Moreover, the directions should be within the range of the students' reading level.

The Overhead Projector

The overhead projector can be a very versatile and flexible teaching resource. It allows for a range of enlarged diagrams, illustrations and content to be shown to both large and small groups of students. Moreover, because you are facing the class, it allows you to maintain student contact, and control, while explaining a particular point. Other advantages include being able to use the projector in normal light with or without a screen. You can also develop or modify a transparency as the lesson progresses. In this regard overlays can be very effective.

Transparencies can be obtained commercially, made from printed materials, or hand drawn. Transparencies can also be developed by students in order to present information and findings from the group or individual work.

The overhead projector can also be used without transparencies to demonstrate relationships, size and shapes. For example, in a maths lesson on fractions, fraction blocks can be placed on the plate and projected to the screen. The teacher can move and point to the materials. Likewise, figures can be silhouetted in story-telling activities as required.

As discussed, above, the projector can also be used as an aid to chalk/whiteboard illustrations.

When using an overhead projector be sure to:

1. Make your transparencies *simple*, clear, colourful, neat and appealing.
2. Check the position and focus of the projector before the lesson commences.

3. Avoid leaving the projector on for lengthy periods during the lesson.
4. Stand to the side of the projector so that the screen image will remain unobstructed.
5. When highlighting points refer to the overhead transparency, not the screen.
6. Use a fine point pencil or pen as a pointer on the transparency.
7. Frame your transparencies to keep them stationary on the projector, and for ease of filing.

Pictures

Pictures can be used at all levels of schooling. They are effective in providing a focal point for the lesson by adding visual impact and providing a stimulus for discussion. They can be most effective in gaining attention at the beginning of a lesson. With young students at the pre-school or junior primary levels a picture talk is a very popular lesson for it allows the class to discuss ideas and share experiences.

A picture can also form the basis for a storytelling session. This gives the students the opportunity to develop their imagination and communication skills. With older students pictures may form the basis for small group discussions.

In selecting and using pictures you should find the following points helpful:

1. Select a picture which can be seen clearly by all students involved in the lesson.
2. The picture should have a clear focal point, be relevant and interesting.
3. Students less than 10 years of age have difficulty reading depth in pictures (Schuller, 1982, p.413). Be sensitive to this in your questioning and discussion.
4. In a picture talk, plan your key questions carefully. Have an appropriate mix of fact and thought questions (see the section on questioning). Be prepared to adapt your questions to the trend of the discussion and encourage student questioning.
5. Collect, mount and file pictures that are appropriate for small group discussions (e.g., pictures from the *Australian Geographic* or the *National Geographic* magazines). You will find that these pictures can be used over and over again in many different areas.

Charts, Maps, Illustrations, Diagrams, Graphs

These materials can be used to summarise facts and information, develop concepts and skills, clarify relationships or introduce points for discussion.

In using charts, maps, illustrations, diagrams and graphs you should:

1. Make sure the students have the background knowledge/skill to interpret the materials.

2. Ensure that maps have the title, direction, scale and legend shown clearly.
3. Make the presentation simple, clear, neat and attractive.
4. Highlight the essential point (or points) through use of space, colour, print variations or pictures.
5. Make sure that all students can see the material.
6. Encourage students to use these forms of presentation in assignments.

Models/Objects

Three-dimensional models are a useful means of adding realism to an explanation. They can re-create images that are difficult to explain in the classroom and have the added advantage of being able to be examined and manipulated by students. Models are particularly appropriate in Science, Health Education, Biology, and Studies of Society and Environment.

In using models you should endeavour to:

1. Ensure that the model is an accurate representation of what you want to explain.
2. Point out the similarities and differences (size, colour, shape) between the model and what it is supposed to represent.
3. Have students handle the model. If possible, arrange to visit or view the actual object represented by the model.

Slides and Filmstrips

Slides are useful resources for they allow you to be selective in what you show and move at a pace appropriate to the class. Filmstrips are more structured and do not have the same flexibility as slides. Nevertheless, they are readily available in school resource centres and add explanatory power to a topic. Commercial sets of slides and filmstrips usually have an audio tape to accompany them.

In using slides and filmstrips make sure that you:

1. Check equipment carefully and set up well before the lesson.
2. Check the audiotape for interest level and suitability. Decide if your commentary would be more suitable.
3. Check that all students can see the screen.
4. Be sensitive in what you show. There is no need to show the whole filmstrip if only a few frames are relevant to your lesson objectives.
5. Discuss with the students the relevant points from each slide or frame.
6. Make sure you introduce and follow up on the viewing.

7. Use filmstrips with audiotapes in small group and individual learning activities.
8. Train the students to use the equipment.

Film, Television and Video

Film, television and video are widely used in schools. This is because of their power in bringing in specialised presenters and educational experiences to supplement classroom work. Film, television and video are especially useful for developing and enriching knowledge, skills and attitudes at all levels of schooling and in most curriculum areas.

The major disadvantage with film, video and television is that they can be a one-way form of instruction. Students are passive receivers of information and usually there is little scope for interaction between them and the medium. Occasionally it is also difficult for the teacher to preview a programme and this increases the possibility of it not being appropriate for a particular group of students.

To use film, television and video effectively it is essential to bear in mind the following points:

1. Check the Teachers' Guide or preview the film or video to ascertain that the programme is appropriate to the age, ability, interests and needs of the students and your learning objectives.
2. Check the content and presentation carefully.
3. Book the equipment for the time period you require.
4. Check lighting and seating arrangements.
5. Do not show the whole film if only part of it relates to your learning objectives. Set the film to run at the section you require.
6. Occasionally try running the film without sound. This will encourage students to think, inquire and interpret information at several different levels.
7. The students are given specific questions to answer, or tasks to carry out, during and after the presentation.
8. The teacher plays an active role before, during and after the presentation. Before the viewing the teacher might review previous work, arouse interest in what is to follow and focus students' attention on specific points to look for in the presentation. During the presentation the teacher should supervise the students. At the end of the programme the teacher should reinforce learning through discussion of the focus questions or some other form of oral or written activity.

Audio Material

The major type of audio materials that you will use on teaching practice are the cassette recorder and the radio. Audio material, like film, television and radio, can bring in educational experiences from beyond the classroom and is well suited to studies of society and environment, language, music, maths and science. In using radio for a broadcast lesson you should follow similar principles to those outlined above for film, television and video. This is especially so in regard to checking the Teachers' Guide before the broadcast and preparing a suitable introduction and conclusion to the session. You should endeavour to minimise passive listening and maximise active involvement in the broadcast.

Cassettes can be used in all subject areas but are especially useful in language classes. Because of their flexibility they are especially well suited to small group and individual work. Cassettes are most effective in gaining attention at the beginning of a lesson or in providing variation within a lesson. Students also like to record material on cassette to play back at a later period.

When using audio material:

1. Check that the cassette recorder is in working order. Have spare batteries in case of breakdown.
2. Make sure that the recording can be heard by all students.
3. If possible check that the level and quality of language is suitable to the students.
4. Be imaginative—if appropriate use the cassette for:
 - recording exercises and activities (e.g. drills)
 - real and imaginary interviews
 - recording plays or advertisements with sound effects music
 - student work presentation—especially performance
 - evaluating student work (e.g., language)
 - recording broadcast lessons for future use (copyright permitting)
 - analysing and improving your own teaching.

The Computer

The computer is an integral part of the modern classroom and, as such, is a widely used and invaluable tool in helping teachers promote learning. This is especially so when use of the computer is integrated with the total learning program (Oliver, 1993). Computers are used in at least two key ways in the classroom: first in learning about computers and how to operate them and, second, as a tool for learning. In terms of learning about computers, students learn about the functions of computers, keyboard techniques and word processing programmes. As a tool for learning, the computer has a wide range of applications such as delivering drill and practice

activities, tutorials, games and simulations, and programs for learning to read, write and compute. Computers can also provide access to information and data bases through CD-ROM and, if a school is networked, the Internet.

Computers are not only used to facilitate learning in the classroom but they are also an important resource for teachers. For example, they can be used for record-keeping and classroom/school administration. Increasingly, computers are also being used for professional development by accessing material about teaching and learning on the Internet.

One of the major potential advantages of using computers in the classroom is that teachers can meet a full range of cognitive outcomes, from simple recall to abstract thinking and problem-solving, at a pace suited to an individual or groups of students. Computers can also facilitate the learning of more challenging/interesting/difficult material (e.g., accessing the Internet or use of a CD-ROM), as well as independent learning and provision for individual differences through the use of the Internet, word processing and tutorial programmes (see Chapter 9). Computers also provide flexibility in organising learning for students as they can work individually, in pairs or in groups. Students also generally find the use of computers motivating (Good & Brophy, 1997).

The use of computers in the classroom has not been without difficulties. One of the major problems has been training teachers to make best use of computers: too often teachers have avoided, or misused, computers or have not been able to integrate learning packages with the class curriculum. There have also been logistical, timetabling and organisational difficulties within schools. Also it can be time-consuming, expensive and difficult to find appropriate software.

To use computers effectively in the classroom it is essential to bear in mind the following points:

1. That the teacher be skilled in using computers, and has a positive attitude toward their use in the classroom. It is also important that teachers keep up-to-date with new systems and software.
2. That use of the computer be integrated with the total learning programme, that software is appropriate to the lesson/topic/curriculum, and the teacher knows how to use it
3. That there are enough computers/printers in working order in the classroom. If access to the Internet is required then computers must also be networked.
4. The teacher's role should be that of facilitator, manager supporter and encourager, rather than transmitter of knowledge. Effective computer-based learning is student-centred learning.
5. That back-up work should be prepared in case of computer malfunctions.

6. The modelling of the use of the computer to students by keeping records, writing reports and storing classroom data on the computer is important in shaping student attitudes towards computers.

7. That students be encouraged to use computers both in and outside the classroom.

Note: The use of computers in the classroom is further developed in Chapter 9, Adapting to Individual Differences.

ACTIVITY 5.7

To review your learning about instructional resources, complete the following activities:

1. List five factors that should be taken into account in selecting and using instructional resources in the classroom.
 - (i)
 - (ii)
 - (iii)
 - (iv)
 - (v)

2. For each of the following instructional resources summarise their potential advantages/disadvantages and indicate the extent of use (on a scale of 1 [not at all] to 4 [frequently]) each resource would have in a classroom of your choice.

Resource	Potential Advantages	Potential Disadvantages	Extent of Use (Scale of 1-4)
The chalk/whiteboard			
Worksheets			
Print materials			
Overhead projector			
Pictures			
Charts, maps, illustrations, diagrams, graphs			
Models/objects			
Film, television, video			
Radio/Cassette			
Computer			

3. Write a paragraph outlining your beliefs about the use of instructional resources in the classroom.