# CHAPTER 8
# LESSON PREPARATION

## 1. INTRODUCTION

Each professional activity is preceded by preparation. A minister's sermon represents days of hard work in his study. A lawyer cannot properly defend an accused in court unless he has done weeks of prior preparation. This preparation is not conspicuous but the quality of professional activity and conduct is evidence of it. In this respect, a teacher certainly is a prime example of someone whose professional activity must reflect his thorough preparation. The fact is, all teachers must be prepared. Hence, anyone who is involved with teaching must be prepared, and this includes the entire range of teaching from pre-primary teachers to instructors at a university.

A teacher's preparation essentially is preplanning a lesson situation that he is going to establish in the future. He must plan each aspect of the lesson he is going to present because it should not progress haphazardly and because, as a professional educator, he must be able to account for what he brings about in a classroom. He must prepare for each particular lesson because the children for whom it is meant are not completely predictable. This makes his didactic reflection difficult. A teacher can never say with certainty if the children in his class are going to learn the new learning material in a particular way or if his planning will necessarily result in positive learning results. However, these uncertainties are not an excuse for him to not plan his lessons. Rather, the opposite is true: a teacher must thoroughly take into account what is unpredictable because ultimately he must be responsible for what occurs in his classroom.

In the previous chapter it was often mentioned that a teacher must continually search for harmony between form and contents in his classroom practice. That is, his lesson preparation is nothing more than his academically and professionally polished initiative to establish a ground plan (lesson plan) in terms of which he is going to create a harmony between form and contents in a particular classroom situation. This ground plan must include certain elements that reflect the demands of the subject contents and the

circumstances [situations] of the children. Also, the unforeseen has to be allowed for in the general ground plan; his lesson preparation must be flexible, but it also has to appropriately reflect the essentials of the didactic-pedagogic and subject didactic.

This ground plan is discernible in the lesson write-up and in the classroom realization of the lesson situation as previously stated in the plan. Lesson preparation, thus, is a teacher's professional responsibility. He must be able to be didactically-pedagogically accountable regarding the form of the lesson and he also must be able to account for the subject scientific and subject didactic meaning of the contents he is going to unlock in the lesson. His lesson preparation is his justification for the choice(s) he has made to harmoniously synthesize the form and contents of his lesson.

Although the expression "practice makes perfect" is applicable to a teacher's classroom practice, this does not mean that he will necessarily arrive at an accountable practice during the course of his classroom experiences. Neither does this mean that a student teacher is abandoned to his inadequate teaching experience. Rather, an "experienced" teacher who does not continually keep himself abreast of the developments in teaching theory and the subject matter he teaches stagnates in the experience of one year. Such a teacher with ten years of experience really has repeated one year's experience ten times.

A young teacher is not completely defenseless when he enters a classroom for the first time. At least he possesses a thorough orientation with respect to a number of subject sciences that constitutes one leg of the possibility to establish a meaningful classroom situation. In this respect, a young teacher has the benefit of being formed in a subject science and, at least, he is up to date regarding contents. His subject study is of such a nature that he has mastery of the structure of the subject area in the sense that he understands the essential relationships that are the basis of constructing the subject and he knows what is superficial and incidental.

This subject mastery underlies the possibility that a young teacher can penetrate a particular theme to its essences (that will constitute

the core of his unlocking) and, accordingly, structure the course of the lesson he is going to present. A young teacher knows what a child must understand about the theme and he also is able to evaluate his own unlocking so that, at least, he can meet the demands set by the nature of the subject.

Unfortunately, subject knowledge alone is not sufficient for a young teacher to guarantee that his teaching the contents to a child will be meaningful. Today there is still the view that the mastery of a particular subject insures successful teaching—a misunderstanding that reigns supreme at universities and other tertiary institutions. All of us know the brilliant academician who cannot make contact with students at all or who cannot properly explain the subject contents. Students endure such an instructor and cannot be at all convinced of the meaningfulness of his teaching. The conclusion is that subject knowledge alone is in no respect a reflection of the ability to unlock the essences of the contents in such a way that students will assimilate them as meaningful.

A young teacher's didactic-pedagogic and professional training provide him with the other leg of his practice. They provide him with the basis for scientifically accounting for his practice. In his scientific study of didactic pedagogics (teaching a child by an adult), a basis is provided for interpreting his subject knowledge didactically-pedagogically. The fact is that a teacher does not unlock the contents for the sake of the contents or subject; he teaches the subject (as a representation of an aspect of the total surrounding reality) so that a child can acquire a better understanding and skillful manipulation of reality. The aim of this achievement is for a child to eventually be able to relate to reality in more responsible (adult) ways.

Lesson preparation is primarily involved with a teacher's scientifically accountable interpretation of his subject knowledge. On this basis he can crate a harmony between the form and contents so that he can ensure the meaningfulness of the lesson he is going to present to a child. Because the lesson situation and the learning activity occurring in it are so complex, a teacher can hardly ignore his planning. For this reason, it is meaningful to write up the lesson. The lesson write-up helps him to continually be accountable

for the harmony between form and contents that he is going to establish for particular children in a particular lesson situation.

## 2. ASPECTS THAT MUST BE TAKEN INTO ACCOUNT IN PREPARING A LESSON

In the previous chapter it was indicated how a didactic theory results in a lesson structure. This is really a logical necessity because if this is not so, it means that the theory really is empty speculation and, thus, that the lesson has no source. The description of the essences of the lesson structure also was directed at clarifying the relationship between theory and practice. In this work, the fundamental reflections that a teacher must take into account in creating a meaningful lesson situation are clarified. From this it is clear that his lesson preparation and planning are the pivotal points of his professional activities. In the narrowest sense of the word, a teacher's lesson preparation is the "ground plan" for his teaching. Everything that his professional training can influence in a classroom must be taken into account in his lesson preparation and be evident in his lesson write-up.

In his lesson preparation, a teacher must justify his interpretation of both his academic subject knowledge and his didactical-pedagogical knowledge in light of the demands (didactic criteria) that the practice of teaching presents to him.

At the end of his lesson a teacher must be able to declare in a straightforward way that his lesson has met all of the didactic criteria because the child for whom the essences of the lesson contents were unlocked has properly appropriated them. In his preparation a teacher must solve the problem of how he can meaningfully interpret his theoretical (academic) subject knowledge for a child. That is, he must be able to interpret the contents in terms of the child's present life and, at the same time, show their meaningfulness for his life as a future adult. In addition, he must interpret the contents for him in such a way that the social, cultural, scientific and technological requirements of the particular didactic situation are structured in such a way that a child is going to be meaningfully involved in the learning situation.

Essentially, the problem of the purposeful preparation a lesson is a problem of meaningful interpretation. This meaningful interpretation necessarily concerns and includes a whole variety of factors that are relevant to a teaching situation. For example, one thinks of a child's foreknowledge in light of which a teacher must be able to answer the question of how he can introduce the new learning material to a child in such a way that, in light of his knowledge and experience, he can experience the theme as meaningful, but also, at the same time, experience that his knowledge is deficient, which then can serve as a motivation for him to want to learn.

Other factors that can influence the course of a lesson are the time available, the composition of the class (homogeneous or heterogeneous), the contents that will follow the unlocking of the theme, etc.

The result of a teacher's interpretation of didactic theory in a particular lesson situation is a specific lesson structure in which he gives evidence of the mutual and reciprocal relationship between theory and practice and the way in which both are relevant to the situation he is planning. Therefore, it is important to indicate what the various facets of the lesson situation are that he must interpret to be able to accountably prepare a lesson. The lesson situation that he envisages is the result of his interpretation of the following factors:

## 2.1 Pedagogic-didactic categories and criteria

Interpreting the pedagogic-didactic categories and criteria means that a teacher is able to justify the particular lesson situation he has established in light of his knowledge of what a didactic situation is (categories) and how he can evaluate (criteria) if the structure he has created reflects the essences of the didactic.

## 2.2 The child

This especially involves the level of a child's insights into his possessed knowledge and the quality of these insights. For example,

questions that must be answered are: What does a child know about this theme? What has he already experienced about this matter? Is his coordination of such a nature that he can carry out this activity properly? What experiences are necessary for a child to be able to master these new contents? In this framework it is only logical that a teacher cannot unlock specific contents that lie outside of his conceptual field.

## 2.3 The nature of the subject matter

The unique nature and structure of the subject matter that a teacher is going to unlock for a child are of particular importance for interpreting the subject. In this respect it is important to note that an inductive methodological principle is more relevant for certain subjects because it can better contribute to gaining insight into the subject while a deductive point of departure is necessary for another subject.

## 2.4 The methods of unlocking (teaching)

In light of the fact that the methods of unlocking are one of the aspects that brings about the form of a lesson, by the nature of the matter, the choice of a method of unlocking has to be relevant to the didactic ground-form chosen, a child's level of readiness and the particular nature of the learning contents. The method a teacher uses is only meaningful to the degree that it is integrated with the other demands of the course of the didactic. Thus, no method exists as "the" method. Each method has the right to exist to the degree that a teacher can justify his choice of it, i.e., to the degree that it is an organized part of the whole of his lesson.

The pedagogic-didactic demands that each lesson must fulfill do not diminish a teacher's originality or creativity. The contrary is actually true: the didactic categories offer a teacher the possibility and also the mandate to exercise his originality and allow his creativity to thrive. The fact that children differ essentially from each other and that one class differs from another is a task for a teacher to at least harness his originality and creativity in each lesson situation. Thus, he must continually look for ways of recognizing the individual differences of the children in his

classroom and to modify, accordingly, his unlocking of reality in such ways that each child can be meaningfully involved in the lesson event. To succeed at this, a teacher must reflect and reflect again and this directs a particular appeal to his originality and creativity.

The above implies that a teacher must know a child thoroughly if his unlocking of reality for him is to be meaningful; however, knowing a child as a person is not sufficient. A teacher also must thoroughly know his level of attainment and his readiness to understand new knowledge as well as his ability to integrate this new knowledge into his horizon of knowledge. This implies that a teacher's pedagogic-didactic knowledge of a child has to be integrated with the requirements the learning material demands.

A teacher's pedagogic-didactic knowledge is the basis for deciding the didactic ground-form(s) into which he is going to cast his lesson; the methodological principles and unlocking (teaching) methods he is going to use; the principles by which he is going to order and systematize the learning material; and the forms of actualizing the didactic principles he is going to select. All of these choices are made against the background of a child's situatedness and ability to understand the new learning material.

A child and his situatedness are not the only aspect a teacher must take into account to arrive in making decisions, even though he does unlocks reality in behalf of a child and especially in behalf of his eventual becoming adult. The nature and complexity of the learning material also must be considered in his choices and decisions. If a child is the only consideration in a teacher's reflection, the harmony between form and contents becomes disturbed. Such a teaching practice is pedo-centric (child-centered). However, where the contents (subject contents, learning material) are given the greatest weight in planning a lesson, the harmony between form and contents also is disturbed and such a teaching practice is described as subject matter-centered.

It is a teacher's task in the secondary school to acquaint a child for the first time with the systematized subject sciences that are represented by the school subjects. Thus, it is obvious that a

teacher has to understand the essences of a subject itself so that his decisions about the contents can, at least, be accountable. Consequently, a child and the structure of the learning material must be taken into account in order to choose particular methodological principles (inductive, deductive or their combination) and corresponding specific methods (or combinations of methods in their essential, logical relationships to the didactic ground-forms) in terms of which he is going to unlock the theme for a child.

When a teacher wants to establish a lesson situation it is necessary for him to be able to justify the aim that he will and must attain with the lesson. Therefore, he also must be able to account for the ways he plans the course of the lesson to be able to attain the aim stated in his lesson prospectus, i.e., how he is going to introduce the lesson, how he is going to unlock the new learning material and how he is going to ascertain (control, verify, monitor) whether the children have mastered the learning material that he previously stated in his lesson plan as the lesson aim. He must be able to justify the ways he is going to give life to the didactic modalities, i.e., how the didactic principles, the child's modes of learning and the implementation and use of teaching and learning aids are going to function in his lesson to attain the lesson aim.

Now the question is how are all of these aspects integrated with each other and how must they be assembled into a lesson scheme or framework that is evident in a lesson write-up? To be able to answer this question it is necessary to briefly summarize the aspects of the lesson structure in a systematic context so that the scheme or framework derived from them can serve as a basis for a lesson write-up that can reflect the essentials of the lesson structure.

## 3. THE ASPECTS OF A LESSON STRUCTURE

### 3.1 Teaching aim

Instruction in school is purposive. Thus, in each lesson there must be an aim. The aim in itself is not referred to because it is only thinkable in light of the essences of the learning material and the insights a child must acquire. Consequently, the preference is to

talk of a teaching aim as an overarching concept under which a lesson aim, a learning aim and stating the lesson problem are subsumed.

When a teacher wants to unlock new contents for a child he must carefully formulate the lesson aim he wants to attain by exposing the learning material. The theme that he has now elevated to a lesson aim is put in the work scheme. The themes that appear in the work scheme according to weeks, months and in some cases even according to days delimit the themes he has to cover in a specific time. In its turn, the work scheme is derived from the curriculum. The insights, skills, knowledge structures, appreciations, etc. that appear in the work scheme as themes have to be elaborated and restructured into a lesson aim by a teacher.

The theme that appears in a work scheme is merely an announcement. A teacher has to elaborate this announcement into a lesson aim following didactic-pedagogic considerations and subject matter criteria. The lesson aim is what a teacher aims for, what he wants the children to attain. Such an aim is not necessarily motivating enough for a child to awaken and direct his achievement consciousness simply because he does not know precisely where the teacher wants to lead the lesson. For this reason, a lesson aim needs to be presented in such a way (by means of stating the lesson problem) that a child experiences the meaningfulness of the theme and accordingly will want to learn the stated aim.

A learning aim appears from stating the problem—it is what a teacher expects a child to achieve and what he wants to achieve in order to solve the problem because by means of the problem statement, he experiences the theme as meaningful. A precondition that makes formulating a lesson and learning aim possible is that a teacher has first reduced the learning material to its essences. The curriculum, syllabus and work scheme are all reductions of reality to essences. For a teacher, a work scheme is the first reduction because in choosing and structuring the themes taken up in it there already is a reduction in the sense that this choosing and selecting announce the essences of the subject.

A teacher now reduces the theme further to its essentials on the basis of his knowledge of the subject matter: he strips the contents of everything superfluous and unnecessary until only the elementals or essences remain. The essences of a theme are what a teacher will require a child to understand. While he is involved in reducing the contents to their essences, he takes note of a child's relevant foreknowledge; a child's readiness to be able to properly master the new contents; possible bottlenecks that can arise in his exposition of the contents and the ways a child's insights into the matter can be restructured in order to serve as a framework for insight into the new learning material.

From the above, it is clear that there are close relationships among the lesson aim, the learning aim and reducing the contents to their essences. This amounts to a teacher interpreting particular learning material in ways that are meaningful for a child's existence. In order to interpret the learning material didactically and existentially, he must first reduce it to its essences. From this reduction a teacher can appreciate and formulate the aim stated in his plan for a specific lesson as well as the learning aim he expects a child to attain as something meaningful to him.

Because a child's learning intention, and thus his achieving consciousness, is most effectively awakened and directed by problems, a teacher has to guide him in such a way that he eventually experiences the problem as his own. A child cannot accept such a problem as his own if the theme is merely announced—announcing a theme is not stating a problem. Thus, a teacher is compelled in introducing his lesson to search for ways to allow a child to experience his inadequate insights, possessed knowledge, skills, etc. as deficient. Should he experience this deficiency as well as that his knowledge of the theme is inadequate for him to solve the problem, this awareness of inadequacy is the motivation and incentive for solving the problem, provided the problem is meaningful to him. What a child wants to know in order to solve the problem is really the learning aim.

It is clear that stating the lesson and learning aims lead in natural ways to formulating and solving a problem. In order to eventually arrive at a meaningful problem solution, a teacher's reduction of the

learning material to its essences and his knowledge of a child are preconditions. Thus, these aspects must necessarily be attended to in a teacher's lesson preparation and be evident in his lesson write-up. The way this can be done is exemplified later in the chapter.

## 3.2 The pedagogic-didactic imperative

The quality of a lesson is not only in the harmony a teacher establishes between form and contents. He must also structure his lesson so that it is didactically refined and pedagogically meaningful. Although the importance of the didactic ground-forms, the methodological principles, the principles for ordering the learning material and the didactic modalities were discussed at length in the previous chapter, and also briefly indicated in this chapter, nevertheless, it is important to again indicate that a teacher has to understand the individual character of each separately as well as their reciprocal relationship to and mutual interdependencies on each other. Therefore, a teacher has to bring these factors into a particular relationship with the demands made of him by the learning material and the child in order to be able to account for the specific type of lesson he creates. Although he has to make room for and realize the didactic principles and criteria in his lesson structure, this does not mean that he must surrender his practice to so-called didactic "recipes"—his own lesson is essentially original because the children for whom he unlocks reality are always unique.

A teacher's practical originality is equivalent to his ability to appraise a child in the specific didactic situation, and then, in accordance with his appraisal, create a didactic structure (grounded in didactic categories and corroborated by didactic criteria) by which he can better guarantee that his exposition improves a child's relationship to reality. Even though there is no rigid lesson typology, still there are structural correspondences among the different lessons that give a lesson its particular character. In this sense, there are types of lessons, e.g., a demonstration lesson can be distinguished from an experimentation lesson, from an appreciation lesson, etc. The type of lesson a teacher states in his lesson plan has to be thoroughly thought through in his planning and be evident in his lesson write-up. The reason is that a type of lesson will have a

specific emphasis especially regarding the modes of learning of a child, the teaching and learning aids that are going to be used as well as the teaching aim.

## 3.3 Actualizing foreknowledge

A teacher's lesson aim is for a child to attain the learning aim during the course of a lesson. Although this statement is patently obvious, nonetheless it is fundamental in that a teacher must understand the factors underlying the attainment of the learning aim. A teacher has to stimulate a child's foreknowledge of a theme. This foreknowledge includes bringing into view knowledge, skills, experiences, insights, attitudes, dispositions, etc. of relevance to the theme. In this sense, foreknowledge is not limited only to cognitive (intellectual) mastery; it also implies a child's experiences that are relevant to the theme.

In stimulating a child's foreknowledge, a teacher really is involved in helping him to consciously re-live his experiences and placing his foreknowledge in a new framework (the framework of the theme the teacher is going to unlock for him). In this way, it is possible to allow a child to experience the new theme as meaningful. During the course of a lesson, a teacher is continually involved in placing a child's foreknowledge in meaningful relationships, but in ways that lead him to experience a problem that is inherent to the new theme. A teacher accomplishes this because he supports and guides him to seek answers or solutions to the problem (or question) with which he confronts a child. In this way a teacher stimulates his foreknowledge in relation to the new knowledge that he experiences as a problem. Thus, a teacher evokes and directs a child's previous insights, skills and knowledge structures so that he can solve a problem (answer a question).

Placing a child's foreknowledge in a relationship with the new theme is a precondition and thus is necessary if a teacher is to reach a didactically "fruitful moment" in unlocking the new contents. In its turn, this fruitful moment is a precondition for the further unlocking of the new theme for a child. It underlies the possibility of attaining authentic learning results because without it a child is unable to eventually form concepts, understandings, etc. regarding

the theme properly. The possibility of a fruitful moment is that a child, with the help and guidance of a teacher, can generalize and abstract the unlocked essences of reality (the contents).

That a child has acquired new concepts and insights does not mean that a teacher can now leave him at his own devices or that his grasp of them will be lasting. Further, this acquisition does not imply that he is mobile or flexible with the theme—the requirement is that he has to firm up such insights and concepts by exercising them. However, before a teacher can assure himself that a child has the essential insights into the theme at his disposal, he has to actualize the lesson contents by controlling (verifying, monitoring) the essences of the theme's structure. This control of the essences can be accomplished by arranging them into a logical scheme (schematizing them), by supporting a child to use his newly acquired concepts and insights; this use includes two forms of practice or exercise (namely, practicing *to* insights, which is especially important in acquiring activity structures, and practicing *of* insights•), and, finally, by evaluating his insights into the new knowledge structure.

The relationships among these matters are important aspects of a teacher's preparation and must be evident in his lesson write-up.

## 3.4 Didactic principles and the phases of a lesson

If there is one thing that can be said of a lesson situation it is that it is dynamic. Thus, in his lesson preparation a teacher plans a dynamic course. It is for this reason that, in his planning, he needs to think about how he is going to let the dynamism of a lesson take its course and how, by virtue of the pedagogic-didactic requirements, he is going to direct the lesson. That is, in the course of a lesson, he has to realize the different principles of actualization (activity, differentiation, individualization, socialization and tempo variation).

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• It seems that there is the following rough analogy: practicing *of* insight : reproductive thinking :: practicing *to* insight : productive thinking. ( G.D.Y.)

Further, in his preparation, he has to be able to justify the principles of actualization to be used in each phase of a lesson in order to allow the particular phases to take their course. Therefore, he has to be able to account for a relevant principle of actualization (or combination) during the lesson phases of actualizing foreknowledge, stating the problem, exposing the new contents, actualizing the new contents, functionalizing the contents and evaluating insights. The relationships among the principles of actualization and the phases of a lesson are dependent on authentic learning effects in the sense that a teacher must continually search for the most effective principles of actualization for a specific phase in order to guarantee the best learning results. For example, one thinks here of the necessity for implementing differentiation as a principle of actualization in an ordinary classroom situation because an individual child will not necessarily open himself to a teacher's unlocking in precisely the same way as will a classmate.

In a heterogeneous class there must also be further differentiation (e.g., differentiation of assignments or tempo) in order to reach each child. Tempo variation is necessary in each lesson situation (and especially in each phase within a lesson). While stimulating foreknowledge the tempo is faster than while exposing the new learning material. Activity is obvious in each lesson; if a child is not actively involved in the lesson event, he simply is not "present".

These are not matters of course, i.e., they do not "just happen". A teacher must thoroughly plan them and write them into his lesson scheme.

## 3.5 The learning activity

The ways a child goes out to reality are not uniform, e.g., he can sense, perceive or lived-experience it. The ways he enters reality (the way he exists, enters reality out of himself) also are not uniformly or unambiguously describable. For example, the fact is a child does not just purely perceive; during his perceiving he also experiences reality affectively. For this reason, his ways of relating to reality cannot be separated from each other; at most we can distinguish them.

One of the most conspicuous characteristics of a child's going out to reality is that it is a learning activity. Also, his modes (ways) of existing correspond to his modes of learning. It also is the case that in a particular situation, a particular mode of learning must be mobilized (e.g., thinking, perceiving, remembering, etc.) in order to enter reality, depending on the quality of the appeal reality directs to him.

Consequently, in a didactic situation, certain learning material will help determine which modes of learning will best offer a child access to that reality. Correspondingly, it is a teacher's responsibility to take into consideration in his planning the specific modes of learning that are going to be stimulated and directed during the different phases of a lesson. This mainly amounts to a teacher planning the stimulation and direction of particular modes of learning (or combinations) for each separate phase of a lesson because these modes of learning will most effectively promote insight into the contents. In this respect a teacher anticipates the way a child can become properly involved with the contents.

The question that now is important for a teacher is: With respect to the learning material, what modes of learning during the subsequent phases of the lesson are most likely to result in authentic learning effects—during actualizing and stimulating the relevant foreknowledge; during the joint reduction of the contents to essences in the lesson exposition; during unlocking the lesson contents and integrating the foreknowledge with the new structure of knowledge in order to promote restructuring, etc.

The synchronization of the most effective modes of learning with the phases of a lesson is of particular importance for a teacher because the ultimate aim of a lesson is realized in a child's learning activity. Consequently, this aspect of the lesson structure requires particular preparation and planning and also must be evident to a teacher in his lesson write-up.

## 3.6 Teaching and learning aids

In a classroom a teacher is primarily directed to allowing a child to become involved with reality. It is understandable that reality, as

such, cannot merely be carried into a classroom situation. A possible solution to the problem of a reality that is absent from a classroom situation is to represent it by means of teaching and learning aids. In this respect, teaching aids are materials representative or symbolic of reality that a teacher uses to make reality accessible to a child while learning aids are materials by which a child himself can acquire insight into reality to the degree that the material (aid) represents it. A teacher handles and uses teaching aids and a child handles and uses learning aids. Under teaching aids we can mention, e.g., projectors of various kinds, wall maps, models, the chalkboard, and illustrations; learning aids include, among others, textbooks, models, representations, microscopes, and graphs.

The meaning of teaching and learning aids is never found in the aids themselves; a teacher must elevate an object (e.g., a model, a map) to a teaching or a learning aid. The implication is that he must decide when and how he is going to insert particular aids into the course of a lesson and for what specific aim he is going to use and allow the child to use them. It also is clear that this aspect must be thoroughly planned and attended to.

That there is a particular relationship between teaching and learning aids means that in his lesson preparation a teacher must also be able to justify or account for his coordinating and synchronizing the teaching and learning aids with a child's various modes of learning, his readiness and especially his ability to integrate new knowledge, as well as the specific nature of the learning material that is going to be unlocked. This means that a teacher's use of teaching and learning aids during the different phases of a lesson, where they also can be applied, also must be clearly justified. The uses and reason for the teaching and learning aids must be discernible in a lesson write-up.

## 3.7 Controlling (verifying, monitoring)

All of the children in a classroom are not necessarily going to achieve a lesson and a learning aim as they should at the same time and on the same level. Hence, on the basis of his knowledge of a child and of the children in his classroom, during his preparation of

the contents (i.e., reducing them to their essences), a teacher must be alert to possible bottlenecks and problem areas that can arise in his unlocking them.

A child's view of and insight into the learning material that a teacher has unlocked (the learning effect) and a teacher's controlling (monitoring) his insight into the essence of the learning material indicate to him where a child has stagnated. Especially it is in his didactic-pedagogic interpretation of the learning material that he anticipates possible bottlenecks and modifies his unlocking in such a way that these bottlenecks are anticipated in his exposition and, where possible, they are avoided. This act of modifying is always present in the course of harmonizing form and contents.

In a classroom situation the unlocking of the contents is modified according to the quality of a child's immediate learning effect. For this reason, a teacher repeats, allows practice again, allows doing again, returns to previous insights, etc. if he cannot see the quality that he demands in the immediate learning effect. All of this takes time and, therefore, a teacher must provide for it in his preparation. However, when a teacher notices obstinate stagnating and even derailment, he has to provide orthodidactic (remedial) help for which he must also plan in his lesson preparation.

Essentially, lesson preparation is anticipating a didactic situation directed to an authentic encounter between a child and the learning material, i.e., where authentic learning is the dividend or result of a teacher's unlocking reality. This encounter between a child and the learning material must culminate in an improved relationship with reality that, for a teacher, is evident in his improved involvement with the learning material. A child also has to surpass (transcend) the immediacy of the learning material that is carried by his admiration and is evident in his life of values. These achievements are neither mechanical nor obvious—a teacher must prepare thoroughly for them. If his preparation is not evident in a lesson write-up, there is the danger that his preparation merely gets stuck in a line of thinking that cannot constitute or direct a didactic situation.

## 4. THE LESSON SCHEME

The discussions offered in this chapter are not meant only for a student teacher. These discussions offer a student an introduction to the essence of the practice of teaching but for a practicing teacher they can serve him to once again think through the grounds of his practice in order to stimulate a critical attitude toward his own practice. Each lesson ought to be a model lesson—this holds for both student teachers and practicing teachers (if here we seek an analogy with the medical profession, this means that each operation that a surgeon performs, by the nature of things, must be a model operation)—in the examples in a lesson write-up there is no distinction made between a model lesson and an "everyday bread-and-butter lesson". The reason is that the same criteria that are valid for a student teacher's write-up of a lesson for critique also are valid for a practicing teacher's write-up because both must show clear evidence, against the background of pedagogic-didactic knowledge, that they can realize a harmony between the contents (subject knowledge) and the form of the lesson. Ultimately, a teacher's only demand to be considered as a professional practitioner is the degree to which he can justify his practice. The evidence for his justification is in the write-up of his lesson preparation.

At the risk of repetition, it is stated once again that the following discussion should not in any sense be taken as a fixed pattern or recipe. It serves only as a guideline because it is expected that each student teacher and teacher will display his own originality and initiative in his unique teaching situation. Herein lies the possibility that their classroom practice will be dynamic and enthusiastic and will not be based on a recipe that will give it a second-hand and stiff character. Each teacher's originality and initiative are the basis for his style of teaching, something that he must maintain at any cost, provided he can justify it.

The guideline offered here also is aimed at insuring that a lesson will not have a haphazard character. The lesson scheme requires that a student teacher (and teacher) be accountable for each phase of the course of a lesson. Also, a lesson scheme is arranged in such a way that a teacher has to continually keep in mind the unique nature of the subject and a pupil's readiness in order to bring about

a meaningful harmony between the form and the contents of a lesson.

As stated above, a teacher's originality and initiative are evident in his style of teaching. This teaching style is also the result of his choice and implementation of the didactic principles, modes of learning, teaching aids, didactic ground-forms, methods of teaching, etc. After all, it is in these choices and their implementation that his individuality is most forcefully expressed. It is for this reason that observing a practicing teacher by a student teacher can only have limited value—the slavish imitation of an example, irrespective of how good it is, can only obstruct a student teacher's latent style of teaching.

The scheme for a lesson write-up presented below is mainly a systematized and schematic rendering of the previous expositions of the lesson structure. A criterion applied to the scheme is that a teacher's justifications for his choices are synoptically and concisely perceptible.

## 5. SCHEME FOR A LESSON WRITE-UP (LESSON PLAN)

### 5.1 LOCALIZING INFORMATION

5.1.1 **Grade level:** A teacher must know precisely the level of the children who are going to be taught. The level of their readiness will be of decisive importance for a teacher's pedagogic-didactic reflection and planning. This is also going to largely direct his planning. Under this heading the grade is simply mentioned, e.g., grade 4, grade 10.

5.1.2 **Subject:** Here the subject to be taught is listed along with its sub-divisions; e.g., geography (geo-morphology), history (European); mathematics (quadratic equations).

5.1.3 **Time:** Because a teacher must deal with specific contents in a particular lesson or series of lessons, the duration of a lesson is very important. Here the duration of a lesson is written down, e.g., 35 minutes, 40 minutes.

A teacher has to know precisely how much time he has to unlock particular essences of the learning material. The greatest mistake of

many student teachers in this connection is that they want to deal with too much material in a period. This problem originates in the fact that a student teacher has not reduced the theme to its real essences and also that his experience of the children's learning tempo is not yet refined. If the limitations of the amount of time are not thoroughly taken into account in his planning, this results in disturbing the tempo of a lesson. This has the additional effect that a student teacher seldom will arrive at the phases of actualizing and functionalizing the new contents.

The amount of time available for a particular lesson forces a teacher to plan a time division among the different phases of the lesson; e.g., 10 minutes for stimulating foreknowledge and for stating and formulating the problem; 20 minutes for presenting the new contents; 10 minutes for controlling (verifying) the quality of the insights into the new knowledge structure.

By the nature of the matter, a final pronouncement cannot be made here regarding the division of time among the different phases of a lesson. In the lower classes, where the learning material can be presented in one period, perhaps the above example of time division is valid. In the higher classes, especially at the senior secondary level, it often occurs that a period (or even two) is used for actualizing the foreknowledge. Here the practice is often to unlock a theme in a series of lessons over several periods. If a teacher does not bear in mind the time factor, his lesson shows a weak didactic structure and it is loose and disconnected.

## 5.2 GROUPING

Children are divided into groups according to various criteria. It is important for a teacher to know if the children in his classroom are grouped homogeneously or heterogeneously because, by the nature of the matter, the grouping will influence his entire didactic performance.

It also is important for a teacher to know the criteria applied to the particular group, e.g., to form homogeneous classroom groups. Possible criteria or yardsticks that can be used are age, intellectual potentialities, choice of subject matter and interests. Because a

teacher's unlocking of the contents is for the benefit of each child, knowledge of the criteria for grouping is of particular importance to him. For example, if a class is heterogeneously constituted on the basis of age, a teacher must be aware that he has to make provision for much more differentiation and individualizing in his planning.

Under this heading, the grouping is merely named, e.g., homogeneously grouped according to intellectual potentialities; homogeneously grouped according to choice of subject but heterogeneous with respect to intellectual potentialities and gender, etc. The various possibilities for grouping children in a class are great and is a factor that a teacher has to take thoroughly into account.

In light of the changes brought about (in South Arica) by the new differentiated secondary teaching, especially in classroom organization, this aspect of a teacher's planning is especially important. In most secondary schools the grouping of classes often is based only on a pupil's choice of subject. Practice teaches that these classes often are heterogeneous with respect to pupils' intellectual abilities.

## 5.3 THE TEACHING AIM

### 5.3.1 The lesson aim

What a teacher aims for with the specific lesson is explained. The idea is not that a teacher merely transcribes the theme as it appears in the work scheme and presents it as his formulation of his lesson aim. The theme is only an aspect of a subject and must be integrated into the whole in subsequent lessons.

A teacher knows how his pupils have progressed with the theme in a series of lessons, and he also knows what successive insights are going to be required of his teaching. In addition, he knows how the specific lesson theme fits into the whole of the subject.

A teacher has to interpret a particular theme in such a way that it is possible to integrate the foreknowledge of the theme with the succeeding work. For example, a syllabus for 11$^{th}$ grade history includes "The Industrial Revolution". This theme fits into the

Napoleonic Wars and the colonization movement of Australia and Africa. It makes little sense to a pupil to announce "the industrial revolution" as the lesson aim. Since it is impossible to try to unlock or present the entire industrial revolution in one period, this theme has to be differentiated into themes for a number of lessons that form a series such as the inventions that preceded the industrial revolution, the social structure, especially in England, during the industrial revolution, its consequences, with special emphasis on its social-societal and social-economic impact, etc.

As necessary and chronological aspects of the whole, a teacher can transform each of these themes into lesson aims. His purpose is that his pupils must acquire insight into the essential structure of a particular theme because without this insight they cannot progress with the theme as a whole. A careful and precise description of the lesson aim also has the advantage that a teacher knows precisely what he is going to look for in evaluating the pupils' insights. At the same time, this provides him with the basis for structuring his unlocking so that the essences of the learning material and their necessary relationships are effectively made evident to the pupils.

The formulation of a lesson aim is really one of the most important steps in reducing the learning material to its essences. Because a teacher first decides on a lesson aim, i.e., he must first delimit and refine the theme, he is in a position to look for examples by which he can realize his lesson aim. (This also holds for formulating a learning aim). The choice of a specific example by a teacher once again forces him to reduce the learning material and to look at what degree the example is the best fit for the specific situation, the particular structure and complexity of the learning material and the level of readiness of the specific pupils. Later, reducing the learning material is dealt with more fully, but nevertheless it is already necessary in the formulation of a lesson aim to indicate that reduction is a precondition for good planning.

A lesson aim has to be formulated concisely and powerfully, but also accurately, e.g., the *story* of the poem "Barefoot-sounds" by I. D. du Plessis; *the power of a true faith in Christ* as this arises in the purification of the lepers, etc. In these two examples the unlocking

of the contents are going to be directed at the story in the first case and to the power of a true faith in Christ in the other.

### 5.3.2 The learning aim

Just as announcing a lesson theme in the work scheme cannot be a lesson aim, the lesson aim equally cannot be a learning aim for a child. This aspect of everyday practice is often neglected at the cost of the children. Too often a teacher merely announces, "Today we are going to deal with the poem 'Barefoot-sounds' by I. D. du Plessis" or "Today we are going to consider the inventions that had led to the industrial revolution" or "Today we are going to calculate areas".

The task of a learning aim is to appeal to and direct a pupils' consciousness to achieve. Announcing a lesson aim cannot accomplish this. Such an announcement cannot insure that a pupil is going to exert himself to master the lesson theme. A learning aim indicates what a pupil must achieve. It involves insight into the concepts that allow the essences of the theme to be meaningful to a pupil. Hence, now, a teacher must make a choice of one or more good examples by which the delimited essences (as summarized in the lesson aim) can be made available to the pupil.

In the geography curriculum for the secondary school, pupils are expected to acquire insight into the different climatic regions of the world. These regions are simply named, e.g., the equatorial, savannah, warm desert, Mediterranean. Each of these regions is, in itself, a separate lesson theme and can be formulated as a lesson aim. If a teacher handles the winter rainfall (Mediterranean) region and expects that the pupils merely will acquire insight into the connections among factors such as geomorphology, location, prevailing winds, ocean currents, etc. and the ways these connections of factors crystallize into a specific climate region by unlocking the concept "winter rainfall region", the learning effect of his pupils will be disappointing. In this case, a teacher is compelled to choose, e.g., the Southwest Cape region as an example for penetrating and unlocking the essences of this climate region that is caused by the coherence of the various climatological factors. Here the learning aim ought to be "the factors that cause the winter

rainfall region" because the teacher wants his pupils to acquire insight into "the factors that cause" so they understand the term "winter rainfall region" and can deal with it insightfully.

This means a teacher must ask himself, "What precisely are the concepts the pupils must possess to be able to understand the theme?" The answer to this question is the learning aim. As in the case of the lesson aim, the learning aim must be concisely and accurately formulated, e.g., "the factors that underlie the winter rainfall region".

### 5.3.3 Stating the problem

#### *5.3.3.1 Formulating the problem*

The mere announcement of a problem does not in any way mean that it is a problem for the pupils. Experience and science (psychopedagogics) indicate that a child's achieving consciousness is stimulated and directed by a problem. Thus, a teacher is compelled, by meaningfully linking up with a pupil's foreknowledge, to lead and guide him to his own formulation of the problem. This matter is explained in more detail later. Nevertheless, it is necessary once again to indicate that only when a child experiences shortcomings in his own structure of knowledge, in light of the lesson problem, will he accept responsibility for solving the problem.

A task for a teacher is to lead him to formulate the problem for himself and take responsibility for solving it. He must indicate to a pupil that his foreknowledge is inadequate to solve the specific problem. Thus, for a child, solving the problem is aimed at overcoming his own deficiencies in knowledge, insights, actions, etc. A child's wanting to eliminate his deficiencies in knowing, etc. is his motivation to eventually attain the learning aim as well as the basis for his motivation to want to learn.

It is important that the problem appear clearly somewhere for the child. The reason is that a pupil must be continually aware of precisely where the lesson is headed. For example, it doesn't help for a teacher to merely write the learning aim "the factors that cause the winter rainfall region" on the blackboard. Here a teacher must

lead his pupils in such a way that they become aware that their knowledge of the connections among the climatological factors is inadequate to be able to answer the question "what are the connections among the climatological factors underlying the winter rainfall region?" A teacher leads the children to ask this question themselves by linking up with their foreknowledge of, e.g., temperature, temperature change, prevailing winds, precipitation, humidity, air pressure, degree of latitude, ocean currents, etc.

Under this heading, the lesson problem is formulated clearly but accurately: "What are the connections among the climatological factors underlying the winter rainfall region?"

#### *5.3.3.2 Solving the problem*

A teacher's unlocking of the essences of the contents in terms of a chosen example or examples provides the possibility that the essential insights, refined concept forming, coherence of meanings, good solution methods and manipulation schemes become understandable to a child. This aspect of the lesson is planned as a chalkboard scheme and it appears in the lesson write-up under this heading.

In preparing a lesson, a teacher has reduced the contents to their essences and systematized them in his lesson write-up. This systematization merely provides points of orientation to allow the lesson situation itself to progress; in the actual lesson he allows the pupils to participate effectively and actively in that now he, together with the pupils, reduces the learning material. This means that the pupils must experience the coherence of his reduction and to be able to do that they must reduce the material themselves. The purpose of the reduction that systematically becomes evident in the chalkboard scheme is precisely to help the children reduce the material themselves. A teacher's reduction helps them to create order out of chaos; without this reduction they cannot acquire any logical overview of the essences and, therefore, they cannot learn with insight.

Writing down the board scheme in his lesson write-up has a four-fold benefit for a teacher: first, it assures that he has included all of the essences in his exposition; second, it assures him that the

relationships among the essences will be logical and meaningful to his pupils; third, it forces him to make sure that the structure and coherence of the essences will gradually and systematically lead to a solution to the lesson problem; and fourth, it also allows him to become aware of possible bottlenecks and problem areas that can arise and that have to be avoided by means of branching or repeating his exposition. Thus, planning a board scheme is extremely important to a teacher because it assures him, to a high degree, that his unlocking can achieve the anticipated learning effect.

## 5.4 THE LESSON STRUCTURE

Apart from planning the contents of his lesson that were discussed with respect to the teaching aim, the lesson aim, the learning aim, formulating and solving the lesson problem, a teacher must also be able to justify his choices that will give form to his lesson.

The form given to a teacher's lesson depends on the particular relationships among his choices of the didactic ground-forms, methodological principles, principles for ordering the learning material and the methods of unlocking or presenting the contents. A teacher must also plan the didactic modalities for each phase of the course of his lesson because they allow his lesson plan to be mobilized.

### 5.4.1 Form of the lesson

#### 5.4.1.1 *Choice of the ground-form(s)*

In accordance with the unique nature of the learning material and the readiness of the pupils, a teacher chooses a particular ground-form or combination of ground-forms in which the contents can be cast so that they are presented most effectively. Thus, the choices of ground-forms are closely related to the lesson aim.

A teacher chooses from the four possible ground-forms—play, conversation, example and assignment—the particular form(s) that gives his lesson the most favorable form for achieving his lesson aim.

#### 5.4.1.2 *Choice of methodological principle(s)*

In this context, methodological principle means the way that is to be followed in order to present the contents from the beginning of a lesson through its course. The methodological principles are mainly the inductive or deductive principle. In certain lesson situations a combination of the two can be used, e.g., there can be a working through from the inductive to the deductive and the reverse.

The choice of methodological principle will largely depend on the level of readiness of the pupils and the nature and complexity of the learning material. The methodological principle or combination of the two and the order in which they will be used are simply indicated under this heading.

#### 5.4.1.3 *Choice of principles for ordering (arranging) the learning material*

The ways a teacher is going to arrange the learning material is indicated under this heading. He chooses a principle (or combination of principles) of ordering the learning material that will reflect the unique nature of the contents and match a child's level of readiness. He chooses from among the symbiotic, the progressive, the linear, the concentric, the chronological, the divergent and the spiral principles (or some combination) that will make available and present synoptically the essences of the learning material to his particular pupils in the lesson situation in the best and most effective ways.

Planning the form of a lesson usually proceeds in this sequence: choice of didactic ground-form; methodological principle; and principle of ordering the learning material. However, the lesson and learning aim, the unique nature and structure of the contents and the readiness of the pupils also must be taken into account. These three factors need to be considered each time there are choices that determine the form a lesson will take.

Further, in light of a teacher's choice of ground-form, methodological principle and principle of ordering, he can now deduce from these choices the most effective particular ways or methods of presenting the contents in the classroom.

#### 5.4.1.4 *Method(s) of presenting (unlocking) the contents*

Under this heading, a teacher must give a brief explanation of the anticipated method or methods expected to crystallize out of his previous decisions. It is understandable that his choice of didactic ground-form(s) and their logical methodological possibilities will guide a teacher in his choice of particular methods of presentation, that the methodological principle(s) chosen will have a particular influence on his choice of a particular method and that the principle(s) of ordering the learning material are equally important in choosing a method of unlocking or presenting the contents.

It is also important for a teacher to keep in mind that the methods of presentation often change during the course (phases) of a lesson. For this reason, use is often made of various methods during the various phases of a lesson. For example, during actualizing foreknowledge the question-and-answer method or the class discussion is used; during stating the problem, a combination of the question-and-answer method and narrating (lecturing) as a method is meaningfully implemented; while unlocking the new contents a combination of the methods of narrating and demonstrating or the method of experimenting present the essences of the contents, and so on for the other phases of a lesson.

### 5.4.2 The course (phases) of a lesson and the didactic modalities

A teacher's planning must be brought into motion in a lesson and it is the function of the didactic modalities to do this. The movement that is accomplished by the didactic modalities is observable during the course of a lesson. In its turn, the course of a lesson is differentiated into different phases. Thus, it is necessary to plan the didactic modalities anew for each phase of the course of the lesson. For this reason, the course of a lesson and the didactic modalities are viewed as a unity in writing up the lesson plan. In the usual course of a lesson, six phases are differentiated: actualizing foreknowledge; stating the problem; exposing or unlocking the new contents; actualizing (controlling, monitoring) the new lesson contents; functionalizing (applying, transferring); and testing (evaluating).

The didactic modalities are the combined effects of the didactic principles, modes of learning and teaching/learning aids. The choice of a particular didactic principle (activity, differentiation, individualization, socialization and tempo variation) is a determinant of the teaching effect striven for. For this reason, the choice of a particular didactic principle is closely related to the lesson aim. To try to provide more certainty to the learning event, there has to be an additional working through the didactic principles to a delimiting of one or more planned modes of learning. The teaching effect can be promoted by a responsible use of aids such as different real objects, models, slide projectors, tape recorders and films.

The nature and complexity of the learning material and the readiness of the pupils offer a variety of choices of didactic principles, modes of learning and teaching/learning aids. The discussions of the phases of a lesson that follow are merely examples and hence are not the only possibilities.

#### 5.4.2.1 *Actualizing foreknowledge*

During this phase of a lesson, the pupils are led to call into awareness their relevant foreknowledge of the matter under consideration. A teacher helps a child search for meaningful connections between his foreknowledge and the new knowledge to ensure that he attributes meaning to it—a child must experience the new theme as meaningful.

Now, in the lesson write-up a teacher has to explain how he is going to call up the pupils' foreknowledge, e.g., by asking questions about already acquired insights, by leading a class discussion of the work already dealt with, or by letting the pupils talk about their own experiences.

**Didactic principle(s):** Here a teacher has to explain which of the didactic principles (i.e., activity, differentiation, individualization, socialization and tempo variation) are going to be more prominent in this phase of the lesson, e.g., activity and tempo variation. Each pupil has to be actively involved in recalling and implementing his foreknowledge. However, because this involves familiar insights, the tempo can be considerably faster than when exposing or unlocking

the new contents. Thus, under this heading a teacher writes: activity and quick tempo.
**Mode(s) of learning:** It is usually the case that remembering is the most prominent or important mode of learning in this lesson phase. Because in most subjects this involves remembering previous insights in the sense that they are not merely recalled but rather these mastered insights have to be placed in a new framework, which requires thinking, a teacher can write down both remembering and thinking.
**Teaching and learning aids:** The task of teaching and learning aids in this phase is to call up previous insights and hidden knowledge as quickly and effectively as possible. Teaching and learning aids that can be effectively used here are, e.g., a quick chalkboard scheme, a print or illustration, a graph or a scheme.

#### 5.4.2.2 *Stating the problem*

During this phase of a lesson the foreknowledge (hidden insights) is recalled and placed in a new relationship that contains a problem for a pupil. Under this heading a teacher clarifies how he is going to lead a pupil from what he knows to noticing the problem in the new contents by leading him to experience the inadequacy of his insights. This phase requires careful planning because the lesson progresses or falls flat to the extent that a pupil is motivated by the problem to attain the learning aim.
**Didactic principle(s):** The activity of each pupil is essential in this phase of a lesson. During this phase a teacher has to keep in mind the pupils' individual differences so that individualization can occur. Usually during this phase, the lesson tempo decreases because a teacher has to be sure that each pupil accepts the lesson problem as his own problem. Accordingly, under this heading a teacher indicates: activity, individualization and a slow lesson tempo.
**Mode(s) of learning:** In this lesson phase the problem places the acquired insights in a new relationship or structure. For this reason, thinking, as a mode of learning, will be of particular importance. Here a pupil's perceiving is not yet differentiate or clearly directed but his sensing is stimulated. Thus, under this heading, a teacher writes down thinking and sensing.
**Teaching and learning aids:** Because stating the problem really involves stimulating foreknowledge and questioning it from within a

new structure, aids are chosen that call forth previous knowledge again as representations, such as slide projectors, films, prints, diagrams, graphs, tables and schemes.

These aids are usually very effective because they once again represent to a pupil his foreknowledge. It often happens in teaching that these teaching and learning aids are the point of departure for a lesson. By using aids that stimulate a pupil's sensing (e.g., teaching aids that represent the structure, form, order, etc. of a matter as a total or global image), a pupil questions his own knowledge. Here one thinks of a print, a representation, a moving or colored model, etc. Under this heading a teacher simply writes down the different teaching and learning aids he is going to use during this lesson phase as well as their sequences, e.g., graphs and tables and then a scheme.

#### 5.4.2.3 *Exposing (unlocking) the new contents*

Here an explanation is given of the course of unlocking the new contents. A teacher has to clarify how he is going to make the essences of the learning material evident or bring them to the surface. In addition, he must be able to justify how he is going to put these essences in a logical relationship and how they (as they appear, e.g., on a chalkboard as a scheme) gradually make a solution to the problem evident.

In unlocking the new contents, a teacher continually reaches back to his pupils' foreknowledge to make his exposition more meaningful to them. Thus, it is almost a matter of course that, during this phase, use is made of the question-and-answer method, the class discussion, the learning discussion, etc. Because of the nature of unlocking new contents, a teacher continually directs his pupils' perceiving to the essences of the learning material. During this phase, their active involvement is necessary and this gives this phase its particular dynamic character.

During unlocking the new contents, concept formation is primarily what occurs. Under this heading the concepts to which the lesson aim is directed are named. The order and relationship of the concepts are equally important and for this reason they should also be written down. The explanation provided under this heading

differs from a board scheme in that the board scheme makes the sequential (i.e., chronological) and essential (i.e., structural) aspects of the theme evident while the concepts used to unlock the new contents are the contents of the lesson aim.

The didactic modalities also must be fully planned and worked out for this phase of the lesson.

Didactic principle(s): Above, the activity of each child in this phase of a lesson was emphasized. If a child is not continually actively and meaningfully involved in this phase of the lesson, the insights to which it is directed cannot be guaranteed for a child. In addition to activity as a principle, during this phase the lesson tempo will be slightly slower; really the pupil, together with the teacher, reduces the learning material to their essences and grasp the relations between them. During this phase, with respect to the tempo, a teacher allows himself to be guided by the quality of the immediate learning effect. To determine and elevate the quality of his learning effect, a teacher will individualize, especially by means of individually directed questions, and by eliciting commentary from the pupils.

Under this heading a teacher writes, e.g., activity, slower tempo and individualization.

Mode(s) of learning: In this phase of a lesson, insight into the concepts central to the new contents is essential. Therefore, a teacher will actualize those modes of learning most appropriate for and applicable to gaining insight into the concepts. For example, in an explicatory lesson, thinking and perceiving will be central: perceiving to establish a point of focus and thinking to order the point of focus into a profile or relief (e.g., of similarities and differences). Here a teacher simply writes down perceiving and thinking.

Teaching and learning aids: As in each of the other phases of a lesson, the basis for choosing a teaching and learning aid is the nature of the learning material (e.g., is it meaningful to try to present specific concepts visually?), the level of a child (e.g., will this child understand an abstract scheme of a course of action?) and the modes of learning (e.g., which teaching and learning aids can direct perceiving and actualize thinking with respect to the essences of the learning material?).

During this phase, the teaching and learning aids ought to provide a pupil with the opportunity to use them according to his own needs and tempo (e.g., a real object, a model, an apparatus). Because thinking during this phase is implemented on a more reproductive level, aids should be used that call up representations of already acquired knowledge (e.g., slide projectors, films, diagrams, graphs, tables, schemes).
Under this heading a teacher writes, e.g., a model of ..., experimental apparatus for a ... experiment, prints of ..., graphs of ...., tables of ... .

### 5.4.2.4 *Actualizing (controlling) the lesson contents*

Here the concern is with pupils' control of their insight of the essences. In other words, this deals with the control of the immediate learning effect. Under this heading, a teacher explains how he is going to determine whether the pupils have gasped the essences of the learning material, e.g., by intermittent questioning during the unlocking, while gradually completing a prepared part of a whole, etc. During this lesson phase a pupil should be given the opportunity to use and handle his new insights himself.

The nature of some learning material (e.g., mathematics, arithmetic, natural science) is such that the essential concepts and activity structures can only be penetrated to real insight if a pupil practices (uses) the essences until insight breaks through. Under this heading, a teacher must show the different practice examples by which the insight can break through.

During this phase, a pupil has to be able to schematize his newly acquired insights, i.e., place them in a synoptic scheme with his foreknowledge. This scheme needs to include the essences of the learning material as well as the relationships among them. Naming the new insights is also important here—the unambiguous description, articulation, etc. expressed in language requires a pupil to engage in productive thinking (in contrast to reproductive thinking). This entire phase is really focused on stimulating and directing productive thinking. The schemes and names to which the entire exposition has led have to be explained here.
**Didactic principle(s):** Individual insight into the essences of the learning material really distinguishes this lesson phase from the

others. Consequently, individualization is an important didactic principle. During this phase a teacher's guided tempo usually shifts to the background and the individual tempo of each pupil is stressed. Hence, for this phase a slow or fast tempo is not planned. Although activity is obvious in each lesson phase, it is especially important during this phase because a pupil actually (really) has to place the essences of the learning material within his own horizon of knowledge—this requires whole-hearted activity from a child. During this phase, differentiation of the contents is not yet prominent because all of the pupils have to understand the same essences.
Under this heading a teacher writes: individualization and activity.
**Mode(s) of learning:** Since the concern here is to firm up the insights in the sense that each pupil has to assimilate them himself, thinking (especially productive thinking) is particularly important. Often a teacher lets the pupils struggle with the problem on their own and in this way discover shortcomings in their own field of experience. However, it is not desirable for a teacher to abandon them to their own fate during this phase. Usually he helps each child individually by providing supplementary knowledge and skills. Each time a teacher provides help to an individual child he demands that he return again to the matter and look for better insight. Here aids only give direction in finding possible ways to solve the problem. Thus they give impetus to thinking or, when a pupil digresses from a method of solution, again they correct the direction of his thinking and, in this way, serve as controlling aids. Here a teacher simply writes: productive thinking.
**Teaching and learning aids:** General aids are not of much importance here. Aids are chosen and implemented that correspond to each pupil's needs and difficulties. Although here the matter takes an individual course, nevertheless, a teacher has to anticipate these difficulties and make sure he has enough suitable aids on hand. Such aids are listed under this heading.

#### 5.4.2.5 *Functionalizing*

This phase of a lesson is directed to firming up and making functional (useable) the insights the pupils have acquired during the phase "exposing the new contents". Hence, a pupil has to be able to use the insights in similar problem areas with understanding. In this phase, practicing insights often is called for.

This can be seen most clearly where the sequence of work is firmed up in selected practices, e.g., in mathematics and arithmetic. Such practices are explained under this heading.
The new insights must be integrated with the foreknowledge before they can be used functionally (brought into function, functionalized). Integrating the new with existing knowledge demands particular preparation and reflecting by a teacher. This is true for all learning material but because of the multiplicity of the so-called human sciences (language, history, etc.), the problem of integrating the new is more difficult; e.g., in exposing or presenting the reasons for the settlers of 1820 coming to the Cape of Good Hope, teacher and pupils eventually have to integrate this historical event with the Napoleonic Wars and the Industrial Revolution. At the same time, the cultural and especially the constitutional history of the Cape after 1820 are suggested and put in perspective. The integration of new insights with existing ones is explained under this heading.
Functionalizing really implies that a pupil must be able to apply the new insights. The form in which this application can be observed has to be carefully planned and considered and then explained under this heading; for example, application exercises of similar problems, working out one or more related examples, firming up the concept in a pupil's own composition or poem.
Didactic principle(s): Besides the central significance of activity, because each pupil must actively exercise insights, these insights must be integrated and eventually applied, there is mention of a differentiation of learning material because a teacher changes the forms of exercise and application according to each pupil's potentialities. There is also individualization. Once again, the lesson tempo cannot be planned beforehand because each pupil will exercise, integrate and apply his insights according to his own tempo. Here a teacher simply writes: activity, differentiation and individualization.
Mode(s) of learning: During this phase, productive thinking and remembering are particularly important. The pupil has the task of re-structuring his already acquired insights so that they can be integrated and used; in addition, he has to rely on his memory to apply them (behave with insight). It is necessary to indicate once again that the particular nature of the learning material, the pupil's level of readiness and the type of lesson will determine which

mode(s) of learning have to be stimulated and directed during this lesson phase. In an ordinary explicatory lesson, productive thinking and remembering will be listed under this heading.
**Teaching and learning aids:** In addition to direction-giving aids that can encourage thinking, in this phase it is important that aids also be used to monitor (control) whether the pupils' insights into the new knowledge are at the level expected. To ascertain this, a diagram or scheme (without words) can be used for a quick and effective review. Here a tape recorder or a program also is useful.

Each individual pupil has to be given the opportunity to exercise and apply the new insights. For this aim, a chalkboard, unrolled sheets of paper, textbooks, an overhead projector, etc. can be used. Since insight into the essentials of the concept have already broken through, the aids will remain directed only at exercising the insight in new situations. For this reason, as many new problems and possibilities of application as are feasible have to be shown such as, e.g., field trips, exhibits and films.
Here the specific teaching and learning aids are written out.

#### *5.4.2.6 Testing (evaluating)*
After the end of a lesson or series of lessons, a teacher has to test the proficiency of the pupils' insight into and understanding of the essences of the learning material or evaluate their thinking, creativity, activities and experiences about the matter.

Testing and evaluating are always necessary and therefore a teacher has to make provision for them in preparing his lesson. This aspect of a lesson is orienting for both teacher and pupil. By testing and evaluating the pupils' insight into the essence of the learning material, he determines their readiness to progress further in the subject. At the same time, he takes note of the quality (in the sense of effective or authentic learning results by the pupils) of his own unlocking of the contents. By testing and evaluating, he also can ascertain which pupils have a need for remedial help and similarly he can avoid bottlenecks in a remedial program.

For a child, testing and evaluating are orienting in that a teacher affirms for him that his knowledge is satisfactory or unsatisfactory, that he has or has not reached the expected level of achievement,

that he is unable to deal with the essences of the learning material, that he has certain problem areas, etc.

It is self-evident that a teacher has to prepare the form and contents of his testing and evaluating with particular thoroughness. He must know precisely what he is going to test and evaluate. The test has to be constructed in such a way that he can be sure that it reflects the quality of the pupils' insight into and handling of the essences of the learning material. The form the test is going to take also deserves special attention. For example, is he going to test by having the pupils fill in or complete a list of questions, by an essay, by a dictation-exercise, by systematically explaining contents, by a qualitative analysis of a pupil's own constructed object?
Under this heading a teacher provides a complete explanation of both the form and contents of his testing and evaluating of insights.
**Didactic principle(s):** During this phase, self-activity and tempo variation are very important. A pupil must be given responsibility for the quality of his insights into the essences of the new learning material. In this context, responsibility is nothing other than self-activity; a pupil brings his insights into motion, he mobilizes and directs them to solve related problems.

Assignment, as a didactic ground-form, is at the foundation of testing and evaluating in the sense that a teacher gives the pupils an assignment to solve particular problems by means of their insights, to make particular applications, to search for specific relationships, to draw particular conclusions, etc. A teacher differentiates the assignments according to his knowledge of an individual pupil's potentialities; for example, he gives simpler assignments to slower or weaker pupils, and for the stronger pupils, he gives assignments that require more of them with respect to depth and breadth. In this way, there is differentiation and individualization.

The nature of the learning material and the form of testing and evaluating determine whether a teacher sets a minimum time limit and whether the pupils are going to follow their own tempo in carrying out the assignments.
Under this heading a teacher writes, e.g., self-activity, differentiation and fixed tempo.

**Mode(s) of learning:** During this phase, a special appeal is directed to a pupil's memory and productive thinking. In this phase he has to recall his insights into the essences of the learning material and place, order and integrate them in a related problem area and find relationships to be able to properly carry out the assignment. This requires productive thinking that, didactically speaking, provides the means for attaining the didactic-pedagogic aim through unlocking reality, i.e., independence and responsibility. Under this heading a teacher writes, e.g., remembering and productive thinking.

**Teaching and learning aids:** Because the concern during this phase is with testing and evaluating a pupil's insight, skills, knowledge, etc., teaching aids will be used that correspond to the unique nature of the subject matter such as tasks, projects, completing or filling in a list of questions. Here a teacher simply writes, e.g., task, project, etc.

## 6. SUMMARY: SCHEME FOR WRITING UP A LESSON (PLAN)

The above discussion is summarized in the following synoptic scheme:

Localizing information:
- Grade:
- Subject matter:
- Time:
- Grouping:

The teaching aim:
- The lesson aim:
- The learning aim:
- Stating the problem:
  - Formulating the problem:
  - Solving the problem:

The lesson structure:
- Form of the lesson:
  - Choice of ground-form(s):
  - Choice of methodological principle(s):
  - Choice of principle(s) of ordering the learning material:

Choice of method(s) of unlocking (teaching):

## The course (phases) of a lesson and the didactic modalities:

Actualizing foreknowledge:
Didactic principle(s):
Mode(s) of learning:
Teaching and learning aids:
Stating the problem:
Didactic principle(s):
Mode(s) of learning:
Teaching and learning aids:
Unlocking the new contents:
Didactic principle(s):
Mode(s) of learning:
Teaching and learning aids:
Actualizing (controlling) the new lesson contents:
Didactic principle(s):
Mode(s) of learning:
Teaching and learning aids:
Functionalizing:
Didactic principle(s):
Mode(s) of learning:
Teaching and learning aids:
Testing (evaluating):
Didactic principle(s):
Mode(s) of learning:
Teaching and learning aids:

# APPENDIX•
# SOME EXAMPLES OF LESSON WRITE-UPS

The aim of these examples is not to present a "model" to be slavishly followed. Indeed, the examples are not the only ways the themes can be unlocked or presented. The fact is, each teacher, in

• These examples did not appear in the original text but were inserted by me (G.D.Y.). I borrowed them from my translation of Van der Stoep, F, et al.: (1973) **Die Lesstructuur** (The Lesson Structure). Johannesburg: McGraw-Hill, pp. 184-201.

unlocking reality reveals his own teaching style in his teaching activities.

A teaching model only makes sense if a teacher can gauge its basis and boundary, i.e., if he can interpret it in accordance with the didactic-pedagogic context underlying the structure of the model. In a didactic sense, this claim holds for all so-called "models" (models, teaching models, learning models, etc.) because if the "model" does not contain the didactic essentials, it is not really a model of teaching.

What are offered are merely examples of how individual teachers plan to unlock specific content in order to attain a specific teaching aim.

FIRST EXAMPLE:

Localizing information:
Grade level: 8th grade.
Subject: Geography (introduction to map work).
Time: 35 minutes.
Grouping:
Homogeneous with respect to age and intellectual potentialities but heterogeneous regarding gender.

The teaching aim:

The lesson aim: To unlock or present the concept "direction" and to firm up its description.

The learning aim: To provide an answer to the question, "What is direction and how can one describe it?"

Stating the problem:

Formulating the problem: The learners are led via the lesson phases actualizing foreknowledge and stating the problem to pose to themselves the problem, "What is direction and how can one name or describe it?" This problem is written on the left side of the chalkboard.

Solving the problem: During the lesson phase of exposing the new content, the following board scheme is presented gradually:

1. (a) The sun rises in the EAST.
   (b) The sun sets in the WEST.
2. Direction is determined by the sun.
3. NORTH is where the sun is at 12:00 (noon) in the Southern Hemisphere.
4. SOUTH is where the sun is at 12:00 (noon) in the Northern Hemisphere.
5. South is in the opposite direction from NORTH.
6. At night, direction is determined by the stars.
   (a) Southern Cross in the Southern Hemisphere.
   (b) Polar star in the Northern Hemisphere.
7. Direction also is determined by a MAGNETIC COMPASS.
8. Direction is described by N, S, E and W.
9. Between two directions, there also is a direction
   N and E: NE
   N and W: NW
   S and E: SE
   S and W: SW
10. Direction is a description of the position of one place with respect to another place on the earth's surface.
11. Direction is described by a compass card as N, S, E and W and points between.

The lesson structure:

Form of the lesson:

Choice of ground-form(s): discussion, example and assignment.

Choice of methodological principle: inductive.

Choice of principles of ordering the learning material: symbiotic and progressive.

Methods of unlocking (teaching): During actualizing foreknowledge, the **question-and-answer method** prevails. During stating the problem, **narrating alternating with question-and-answer** are the prevailing methods. During exposing the content, **narrating alternating with demonstrating** prevail. During actualizing the lesson content, **learning discussion alternating with free activity** prevail. During functionalizing, the primary method is **drill.** During testing, the methods used primarily are

question-and-answer alternating with the textbook.

## The course (phases) of the lesson and didactic modalities:

### Actualizing foreknowledge:

The pupils are lead by the following questions to actualize their foreknowledge of direction: Where is your house in relation to the school? Where is the City Hall, church, station, etc. in relation to the school? What way must you travel to arrive in Durban, Cape Town, Windhook, etc.? (In each case the pupil has to show where the place is, the direction, by pointing).

These questions give the pupils the opportunity to recall their own knowledge of the relationship between one place and another.

**Didactic principles:** activity, individualization (questions are directed to individual pupils), fast tempo.
**Modes of learning:** mainly remembering alternating with reproductive thinking and perceiving.
**Teaching and learning aids:** the actual City Hall and church spire (which are visible from the classroom). A large aerial photo of the city.

### Stating the problem:

On the basis of explanation and the question, "You have all shown where your house, etc. is, but what have you really shown?", the pupils are guided to answer the question with the word "direction". The question is now stated in terms of the possibility of accurately showing direction when one cannot do so by gestures, e.g., by means of the following questions:

1. How would you **write to** someone where a place is in relation to where you live?
2. How can a ship in difficulty describe **over the radio** where it is?

Now the pupils are guided to conclude that the names of direction must have a shared meaning. It is now advisable that the lesson problem, "what is direction and how can one name it?" be written on the chalkboard.

**Didactic principles:** activity, individualization, slower tempo.
**Modes of learning:** mainly reproductive and productive thinking and remembering.
**Teaching and learning aids:** none.

**Unlocking the new contents:**
By means of questions and narrating, the following facts are established:

1. The sun rises in the EAST.
2. The sun sets in the WEST.
3. Direction is determined by the sun.

Each time, the pupils have to indicate where EAST and WEST are. Maps on the wall with E and W in the correct places are introduced. Also, a map is placed on the floor and an East-West line is drawn through it.

The pupils now are led by the question "Can we also determine the other directions by means of the sun?" to a discussion of methods for determining NORTH with a compass, with a stick in the ground and its shadow, and with a watch. NORTH and SOUTH are indicated and the NORTH-SOUTH line is affixed to the map on the floor as are the letters N and S to the map on the wall.

The pupils are questioned about how they can determine direction at night. The use of the Southern Cross (Southern Hemisphere) and the Polar Star (Northern Hemisphere) are now discussed and explained.

The question "Can we now say where one place is with respect to another?" leads to a discussion of labeling direction. The other points of direction on the compass card are discussed. For example, by the question, "How can we describe the direction of a place between NORTH and EAST?", the pupils are guided to formulate for themselves the label NORTHEAST. The same holds for the other intermediate directions.

The compass card, with intermediate directions filled in, is on the floor and the pupils show with it that the directions on the map are really correct (i.e., really are **on** the earth's surface) when it lies horizontally on the floor, but that we hang the map vertically to more easily work with it. The pupils are guided to deduce that NORTH is always at the top of the map on the wall.

A world globe is now displayed and the following have to be established from questions:

(1) NORTH and SOUTH are the main points and refer to the NORTH POLE and the SOUTH POLE, respectively.
(2) EAST and WEST are not main points but refer to the direction in which the sun rises and sets.

The pupils are guided to deduce that: direction is a description of the location of one place with respect to another by means of N, S, E and W and the intermediate points on a compass card.

**Didactic principles:** activity, individualization.
**Modes of learning:** perceiving alternating with thinking.
**Teaching and learning aids:** maps, globe, magnetic compass and prints of the Southern Cross and the Polar Star.

**Actualizing (controlling) the new lesson contents:**
The pupils are now asked to describe the step by step construction of a compass card. During this task, control of the insights is exercised. The correct labeling of the directions of the wind are especially attended to. The pupils are individually called upon to show and to label the directions of the wind.

**Didactic principles:** individualization.
**Modes of learning:** productive thinking and remembering.
**Teaching and learning aids:** model of a compass card, land maps.

**Functionalizing:**
The insights into direction in constructing a compass card are implemented by the following assignments:

(i) Draw a compass card.
(ii) Determine the direction of the following places from each other according to the principles of direction and their labels (e.g., N, S, SE). Use a land map.

(a) Cape Town lies to the _____ of Port Elizabeth.
(b) Port Elizabeth lies to the _____ of Cape Town.
(c) Johannesburg lies to the _____ of Cape Town.
(d) Cape Town lies to the _____ of Johannesburg.
(e) Pretoria lies to the _____ of Bloemfontein.
(f) Bloemfontein lies to the _____ of Pretoria.
(g) Kimberley lies to the _____ of Bloemfontein.
(h) Bloemfontein lies to the _____ of Kimberley.
(i) Durban lies to the _____ of Pretoria.
(j) Pretoria lies to the _____ of Durban.

(iii) For the quicker pupils, more difficult ancillary exercises are given.
(iv) Describe briefly the meaning of the concept "direction".

**Didactic principles:** activity, differentiation and individualization (especially regarding individual tempo and differentiation of exercises).

**Modes of learning:** productive thinking, remembering, restructuring.

**Teaching and learning aids:** land map of South Africa.

**Testing (evaluating):**
The test completed in the functionalizing phase is evaluated to determine the pupils' insight into the essentials of the learning material. This brief test is collected and corrected after the lesson. For this reason there is no need to make provision here for didactic principles, modes of learning as well as teaching and learning aids.

SECOND EXAMPLE:

**Localizing information:**
**Grade level:** 10th grade
**Subject:** Mathematics (greatest common divisor and least common multiple of algebraic expressions).
**Time:** 40 minutes.

Grouping:
Homogeneous with respect to age and intellectual potentialities but heterogeneous with respect to gender.

The teaching aim:

**The lesson aim:** To synthesize algebraic expressions by factoring and by correctly defining the concepts **greatest common divisor** (GCD) and **least common multiple** (LCM).

**The learning aim:** To effectively implement the concepts **least common multiple** and **greatest common divisor** in such problems as combining algebraic factors and using these concepts insightfully in additional problem situations.

Stating the problem:

**Formulating the problem:** Via the lesson phases of actualizing foreknowledge and stating the problem, the pupils are made aware of their inability to determine algebraically the least common multiple and the greatest common divisor without an analysis into factors. Correspondingly, they are guided by the question, "How can a least common multiple and greatest common divisor be determined by analogy with arithmetic examples?" The teacher writes the question on the chalkboard.

**Solving the problem:** During the lesson phase of exposing the new content, the following board scheme gradually is shown:

1. $8 = 2 \times 2 \times 2$
   $12 = 2 \times 2 \times 3$
   $18 = 2 \times 3 \times 3$
   GCD = 2.
   LCM = $2 \times 2 \times 2 \times 3 \times 3 = 72$.

2. $18a^2 - 18 = 18(a^2 - 1)$
   $= 18(a + 1)(a - 1)$.
   $18a^2 + 18a + 4 = 2(9a^2 + 9a + 2)$
   $= 2(3a + 1)(3a + 2)$.
   $18a^2 - 15a - 18 = 3(6a^2 - 5a - 6)$
   $= 3(3a + 2)(2a - 3)$.
   GCD = 1.
   LCM = $18(a + 1)(a - 1)(3a + 1)(3a + 2)(2a - 3)$

Note: The similarity between the logical construction of the algebraic and the arithmetic example (which the pupils already know) is stressed.

The lesson structure:
Form of the lesson:

Choice of ground-forms: discussion, example and assignment.

Choice of methodological principles: initially deductive and then inductive in order to discover the concepts.

Choice of principles of ordering the learning materials: linear.

Methods of unlocking (teaching): During actualizing foreknowledge: **demonstration**. During stating the problem: primarily **questions-and-answers.** During exposition of the new content: primarily demonstration **intermingled with questions-and-answers.** During actualizing the lesson content: primarily **demonstration intermingled with questions-and-answers**. During functionalizing: mainly the **textbook**. During testing: preponderantly **textbook intermingled with questions-and-answers.**

The course (phases) of the lesson and didactic modalities:
Actualizing foreknowledge:
Since the concepts "factor", "greatest common divisor" and "least common multiple" embrace the core of the foreknowledge, these concepts have to be clarified again with appropriate questions. Some computational examples will be used as demonstrations after the concepts "greatest common divisor" and "least common multiple" are first analyzed so the meaning of each part-concept also is clear. Such part-concepts as "common", "multiple", "factor" must first be illustrated by simple examples.

Didactic principles: activity, individualization, tempo variation.

Modes of learning: Thinking, perceiving, sensing.

**Teaching and learning aids:** chalkboard.

**Stating the problem:**
On the basis of the relevant foreknowledge which is actualized, the pupils realize that at this stage they can find the greatest common divisor and the least common multiple of arithmetic numbers and simple algebraic monomials. The application of the concepts to algebraic polynomials, however, awakens a feeling of the problematic in the child. By further analyzing the problem, they realize that their already existing concepts need to be generalized and can be applied to algebraic polynomials. Here the relationship between "arithmetic number" and "algebraic expression" has to be clearly expressed.

**Didactic principle:** Guided activity.
**Modes of learning:** Sensing and perceiving.
**Teaching and learning aid:** Chalkboard.

**Unlocking the new contents:**
The correspondence between the determination of the greatest common divisor and the least common multiple of arithmetic numbers and algebraic monomials is demonstrated by appropriate examples. The difference in presenting the new lies in the fact that the analysis of algebraic expressions into factors presents an obstacle. The difference and similarity can be illustrated for the pupils by a good example:

**First step:**
Analyze each expression into factors:

| Arithmetic example | Algebraic example |
|---|---|
| $8 = 2 \times 2 \times 2$ | $18a^2 - 18 = 18(a^2 - 1)$ |
| $12 = 2 \times 2 \times 3$ | $= 18(a + 1)(a - 1)$ |
| $18 = 2 \times 3 \times 3$ | |
| | $18a^2 + 18a + 4 =$ |
| | $2(3a + 1)(3a = 2)$ |
| | $18a^2 - 15a - 18 =$ |

$3(3a + 2)(2a - 3)$.

Second step:
Look for common factors in all three expressions and numbers. In the arithmetic example, there is only one such factor, namely 2, which is the greatest common divisor. In the algebraic example, there is no common factor and thus the greatest common divisor is 1.

Third step:
Use the arithmetic example to show how the least common multiple of the three numbers is found. Begin by writing down the factors of eight, namely, 2 x 2 x 2. To make this a multiple of 12, the factor 3 is needed (2 x 2 x 3). In considering 18, an additional factor of 3 is needed (2 x 3 x 3) and thus the least common multiple is 2 x 2 x 2 x 3 x 3 which is 72.

Now the algebraic example is used in a similar way to come to the conclusion that the least common multiple is $18(a + 1)(a - 1)(3a + 1)(3a + 2)(2a - 3)$.

This arithmetic example can also be studied with insight by applying concepts from set theory.

> **Didactic principles:** guided activity, guided tempo.
> **Modes of learning:** perceiving and thinking.
> **Teaching and learning aid:** chalkboard.

Actualizing (controlling) the new lesson contents:
One or two examples with slight differences are now worked through with the pupils to give them the necessary confidence with respect to the correct explanation and factoring.

> **Didactic principles:** guided and self activity, guided tempo.
> **Modes of learning:** perceiving, thinking, imitating.
> **Teaching and learning aid:** chalkboard.

Functionalizing:
Suitable examples are now sought which the pupils themselves have to do so the newly acquired insights can be exercised. In this

assignment, the examples are arranged so that there is a perceptible increase in level of difficulty. A few difficult examples are presented as a challenge for the more discerning pupils.

**Didactic principles:** self-individualization at one's own tempo.
**Mode of learning:** thinking.
**Teaching and learning aid:** textbook.

**Testing (evaluating):**
A number of problems that cover the whole range of difficulty (re factoring) can be presented to the pupils to evaluate their level of achievement. It should always be kept in mind that each problem has to test the essentials of what is presented (unlocked).

**Didactic principle:** self-individualization.
**Mode of learning:** Thinking.
**Teaching and learning aid:** copies of the examination.

THIRD EXAMPLE:

**Localizing information:**
**Grade level:** 12th
**Subject:** Afrikaans (Literature).
**Time:** 40 minutes.
**Grouping:**
Homogeneous with respect to age, subject choice, intellectual potentialities and gender (girls).

**The teaching aim:**
**The lesson aim:** The striking imagery in the "Ballad of Grayland" by D. J. Opperman.
**The learning aim:** To sharpen insight into the way a creative poet goes about characterizing persons in their regular day-to-day existence in the city.
**Stating the problem:**
**Formulating the problem:** Through actualizing foreknowledge and stating the problem, the pupils are guided to

state for themselves the problem, namely, "What image(s) are evoked by gray, grayness, gray land?"

**Solving the problem:** Appreciation as well as explication are dealt with in this lesson; therefore, the poem first is read in its entirety by the teacher.

**The lesson structure:**

**Form of the lesson:**

**Choice of ground-forms:** conversation, example and assignment.

**Choice of methodological principles:** initially inductive; later deductive.

**Choice of principles of ordering the learning material:** Symbiotic and linear.

**Methods of unlocking (teaching):** During actualizing foreknowledge: **question-and-answer method.** During stating the problem: mainly **narration** intermingled with **question-and-answer** which also are maintained during actualizing the lesson content. During functionalizing: **question-and-answer.** During testing: the **textbook.**

**The course (phases) of the lesson and didactic modalities:**

**Actualizing foreknowledge:**

Foreknowledge is stimulated by means of questions about a ballad dealt with previously. After this, questions are asked of the pupils to guide them to the new content.

For example:

What is it like early in the morning in the winter in the center of the city? Can we compare this with Johannesburg? What is the difference? Is the name **Gold City** still appropriate? What image currently is most conspicuous when one thinks of Johannesburg?

Why is the image of grayness considered? What is the composition of the color gray? What is the effect of a gloomy, gray day on a person?

**Didactic principles:** activity, individualization (questions are directed to individual pupils), quick tempo.

**Modes of learning:** remembering, reproductive thinking, imagining, sensing and perceiving.
**Teaching and learning aid:** a large photo of Johannesburg taken early in the morning.

Stating the problem:
In terms of their own experiences, the pupils are guided by the question How does Opperman create a striking image of a person in "Grayland"?

**Didactic principles:** activity, individualization, slower tempo.
**Mode of learning:** productive thinking.
**Teaching and learning aid:** textbook.

Unlocking the new contents:
The entire poem is read to the class in a moving way.

**Didactic principles:** activity and individualization.
**Modes of learning:** sensing, perceiving, productive thinking.
**Teaching and learning aid:** textbook.

Actualizing (controlling) the new lesson contents:
By narrating, part I of the poem is explained further. With several examples, how a young man goes to the city by train, what his impressions are and how he has to perform tiring and irritating work are described. Each stanza is a quick, flashing image of what happens to him. He changes jobs very quickly. He doesn't like the ugly city; he is in continual conflict: a splendid and touching comparison is when he stacks oil drums on each other and this seems like the cells of a honey-cake but they are empty and not full of **sweetness** like a honey-cake; for him his work is meaningless and sterile. There is a precise correspondence between the quick hands that grasp and fold together paper in a candy factory and the fast movement of hands playing a piano; but one brings pleasure and the other monotonous drudgery.

From the personifications in the sixth stanza of saws that "scream", chisels that "chatter", cars that "nag", we hear the irritations and frustrations of the young man who again has changed jobs. The

image allows his growing resistance to become a real experience, especially when he finds himself in trouble.

**Didactic principles:** individualization, activity, slower tempo.
**Mode of learning:** productive thinking.
**Teaching and learning aid:** chalkboard.

**Functionalizing:**
Exercise of insights occurs by dealing with part II with the pupils, but by the **question-and-answer** method.

**Didactic principles:** activity, differentiation and individualization.
**Modes of learning:** productive thinking, restructuring.
**Teaching and learning aid:** textbook.

**Testing (evaluating):**
Part III can be given to the pupils as an assignment to determine their insight into the essentials of the learning material. However, in this case, a composition with the heading, "Me, my brothers and sisters", is given to the class by which they are linked to the generally human confrontation with a world in which they continually have to give an account of themselves.

**Didactic principle:** self-activity.
**Modes of learning:** from imagining to productive thinking.
**Teaching and learning aids:** none.