

ATTACHMENT 7B: The flow of implementation - Cycle 2

Monday 13 May 2002: Organising the class for cooperative learning.

During this lesson I explained to the learners that I had decided to use a slightly different style of teaching from then on. I spent some time explaining that I would still use the methods I had before but that I would supplement these with cooperative learning or working together in groups.

This method would encourage them to cooperate together to learn. I also explained and emphasised that they would use the equipment themselves. Each of the four grades was organised into three to five mixed ability groups depending on the number of learners in each grade. Groups were given the opportunity to choose names for themselves. The names they chose were as follows:

Grade 7:	1. Dikis	2. DVD	3. JD's	4. VIP'S
Grade 8:	1. Slow poison	2. Die crazy	3. Yizo Yizo	4. Die hard
Grade 9:	1. Skhokho	2. Group A	3. Man United	
Grade 10:	1. 3 for joy	2. Honey bees	3. Powers	

I explained and discussed the importance of cooperation and the four group roles were clarified. The learners were then asked what skills they would need to operate productively and well in groups. These were summarised and written on a chart for the classroom. I placed it next to the rules of the class we had developed in cycle one. The language policy which was to operate was agreed upon, the flow of the lessons discussed and the process of worksheet completion explained.

Friday 17 May 2002, Lesson 1: The attractive property of magnets (Video tape 7)

I introduced the pupils to magnets by showing them a bar magnet, asking them what it was and what it could do. I then demonstrated the attractive force. The pulling force of the magnet was then labelled the property of attraction. I then explained shortly the history of magnets. Each group was given a packet containing a variety of substances and a bar magnet. The workers and leaders then had to use the equipment to categorise the substances into those that were attracted by the magnet and those that were not. A writer completed a categorisation table on the worksheet and the findings were fed back to the class by the talkers. These findings were discussed until consensus was reached. The labels "magnetic" and "non-magnetic substances" were then introduced. The

groups worked through a number of transfer problems relating to the concepts covered and recorded their findings. These were fed back and discussed by the class. The communal worksheets were marked and the pupils completed their own from the marked one.

Tuesday 21 May 2002, Lesson 2: The poles of a magnet. (Video tape 8).

After revising the previous lesson using cognitive questions, the roles within each group were rotated. The questions and tasks on the worksheets were discussed and each group was given a bar magnet, iron filings and a piece of paper. Groups were asked to roll the magnet in iron filings and comment, from their observations, on what part of the magnet was the strongest and weakest. Their findings were recorded on their communal worksheet and fed back to the class. The label of poles was then given to the ends of the magnet. Transfer questions and problems such as “If you were given two magnets how would you find out which is the stronger?” were asked and responded to. Group worksheets were then marked and individual ones were completed .

Wednesday 22 May 2002, Lesson 3: The direction finding property of a magnet. (Video tape 9).

Using a compass I first established the directions of north, south, east and west and put up labels on the walls of the class. Equipment which allowed a bar magnet to swing freely was then given to each group and they were asked to record their findings after allowing the magnet to swing freely and settle. In this way the direction finding property of a magnet was established. The poles were then labelled North and South. The concepts of like and unlike poles was dealt with. Compasses were given to each group and their construction and use discussed. The worksheet recording these facts was then filled in by the groups and the transfer questions with regard to the use of the compass completed, fed back to the class and marked.

Friday 24 May 2002, Lesson 4: The law of magnetic poles. (Video 10).

Groups were each given two marked magnets and were required to investigate the effect of their poles on each other in a systematic way. The data was recorded on the worksheets, the learners were asked to study the observations and formulate a rule. These rules were fed back to the class and recorded on the worksheets. In this way the law of magnetic poles was dealt with. The groups

then considered the transfer questions and problems set around this law which were included in the worksheets. Again group answers were verbalised to the class, consensus achieved and recorded on individual worksheets after the group one had been marked.

Tuesday 28 May 2002, Lesson 5: Magnetic fields. (Video tape 11)

Each group was given two bar magnets, a piece of paper and some iron filings. The procedure of sprinkling iron filings onto a piece of paper placed over the magnet and then gently tapped, was explained to the workers. They then returned to the group and carried out the experiment there. Magnetic fields and lines of force were handled in this way. The observations and transfer questions were then dealt with in groups, discussed with the class and the worksheets completed.

Tuesday 31 May 2002.

Lesson 6: Magnetic induction. Triangulated by competent observer (Video tape 12)

This topic was introduced by asking the pupils how an unmagnetised iron nail could be made into a magnet. Theories from the learners were received and recorded. Then I demonstrated how the nail became a magnet itself when touching or when coming very close to the magnet. The attractive property of the nail faded as the magnet was moved further away. This ability of a magnet to pass on its magnetic properties was labelled Magnetic Induction. Learners were required to explain the concept in their own words. The learners then established the polarity of the magnetically induced iron nail through experimentation and observation. Data was recorded systematically on worksheets and the polarity rule established. Learners were then asked for suggestions of how to make magnets. Making magnets out of magnetic substances by stroking them was then carried out by the groups, sketched on worksheets and fed back to the class.

Learner interviews

On this day 5 grade 8 learners were interviewed and recorded on audio tape by the school counsellor using the open ended questions described in the planning phase.

Teacher questionnaires

The principal, school counsellor and four teachers responded to the written questionnaire ,described

in the planning phase.

Tuesday 23 July 2002, Lesson 7: Permanent and temporary magnets. (Not video taped)

I first established the difference between iron and steel through questioning, and then transferred the concept into the learners' own experience. The learners were then requested to predict which of the two substances would be the quicker to magnetise and which would retain its magnetism the longer. After this they were asked to design a way of testing their predictions. The groups were given equipment to carry out the test and were requested to record their findings on the worksheet. This was fed back to the class by the talkers. The meanings of the words permanent and temporary were then established and applied to permanent and temporary magnets. Finally, the use and care of magnets was discussed and recorded by groups on their worksheets.

Friday 26 July 2002, Written achievement test two

For this test the same format and process of administration was used as in cycle one. There was still a strong pictorial and transfer emphasis in the design and presentation of the questions, and help was provided in getting the pupils to understand the questions and procedure of answering. However the level of difficulty of the questions moved up a gear and in places more descriptive language was required. I include some examples of different question types below.

1. I put all of these things into a black bag. I then put a strong bar magnet into the bag. When I take the magnet out of the bag which things will be left behind?

Nickel 20c piece	Copper pipe	Wooden dice	Steel nail
Plastic ruler	Chalk	Iron paper clip	Glass

These things will be left behind:

..... (3)

2. What do we call the substances which were attracted by the magnet and came out with it?

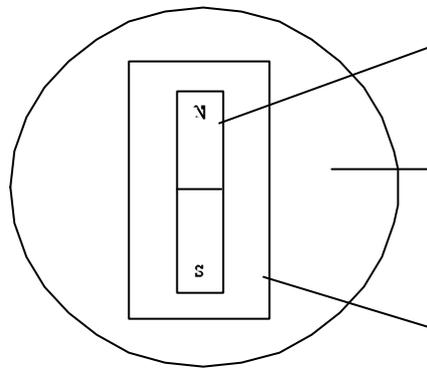
..... (5)

Bowl

Magnet

Water

Piece of wood



5. Here is a bar magnet on a piece of wood. The piece of wood is floating on the water. What will happen to the magnet after a while?

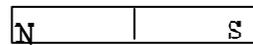
Write down what will happen to the magnet here.

.....
..... (2)

13. Someone gives you two magnets. Magnet one does not have the poles marked on it. Magnet two has the poles marked on it.

Magnet 1

Magnet two



Write

down below what you would do to mark the North pole of magnet one.

1.
2.
3.

I used this opportunity to mark the test in the presence of each learner. In so doing valuable teaching and motivation opportunity was gained.

June 2002: Mid year examinations

During these examinations the learners were questioned on all the work covered in Mathematics and Science from the beginning of the year.