

Talk for Learning

PROFESSIONAL DEVELOPMENT GUIDE FOR **STUDENT TEACHERS**





T-TEL Professional Development Programme

Theme 3: Talk for Learning

Professional Development Guide for Student Teachers



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All sources are detailed in the acknowledgements sections.

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Tutor Professional Development

About These Resources

Welcome to the *Transforming Teacher Education and Learning* Professional Development Guide for Student Teachers.

Transforming Teacher Education and Learning (T-TEL) is a Government of Ghana programme seeking to improve learning outcomes - for tutors in Colleges of Education, (student) teachers, and above all for pupils in school. To that end, we are creating a set of professional development resources for use by you, the (student) teacher, to enhance college-based and school-based teacher education. We also hope that, as practising teachers, no matter how long ago you did your initial teacher education, you will also find this material useful.

The present set of resources are organised into twelve themes focusing on pedagogy and effective college classroom practice, such as creative approaches, questioning, group work, Assessment for Learning, Leadership for Learning, enquiry-based learning, gender, inclusion, and many more (see table below). The themes have been chosen because of their relevance to improving learning outcomes through the use of active pedagogies. In each of the twelve themes there are a number of different teaching strategies (or teaching approaches). For instance, the teaching strategies in Theme 1 “Creative Approaches” include songs, role-play, games, and storytelling.

For each of the teaching strategies within a theme, the resources provide

- an introduction to the teaching strategy (including a group activity that you can do);
- three “Example - Plan and Practise - Teach - Reflect” (EPTR) sequences; and
- activity plan templates (at the end of the book).

Within each “EPTR” sequence there is an **example** for the use of the strategy (e.g. an example for using songs in English), followed by a section to support you in **planning** an activity using the strategy (e.g. planning the use of modelling in mathematics, or planning the use of role-play to illustrate an idea in science). You can then try out your activity (by **teaching** it to your pupils) after which you will find a number of activities for **reflection**, prompting you to think about your experience. For example: *Did the song achieve the intended learning outcomes? Did everybody (including female and male pupils) participate in the activity? What can I do to involve learners with special needs?*

Because each teaching strategy (such as types of group work) has many different aspects (such as same-task group work, different-tasks group work, and carousel-type group work) we have provided **three EPTR sequences**. The examples provided in these are usually in English, mathematics, and

science, with further examples provided in the Plan and Practise Together section.

Student teacher resources would normally be used within your usual College of Education teacher education programme, particularly within the elements relating to teaching practice. However, the resources are self-contained, and can be used for self-study by (groups of) in-service teachers, see below. Note that we will use the words “teacher” and “student teacher” interchangeably throughout, to designate both student teachers (who are still in college), and practising teachers.

For each theme, the teaching strategies are presented together in a single book (in print), but they are also available online on the T-TEL website in various formats (such as HTML, ePub, PDF, see oer.t-tel.org) alongside supporting information. All T-TEL resources are Open Educational Resources (OER), available under a Creative Commons Attribution Share-Alike licence. This means that you are free to use and adapt them as long as you attribute T-TEL and retain the same licence. In fact, we have used that same process to develop these materials from other OER that are available, such as the OER4Schools programme (www.oer4schools.org), the TESSA Ghana materials (www.tessafrika.net), and even materials originally developed for India (www.tess-india.edu.in).

Theme number	Theme
1	Creative Approaches
2	Questioning
3	Talk for Learning
4	Group work
5	Leadership for Learning
6	Finding, creating, and using teaching and learning materials
7	Assessment for Learning
8	Gender and inclusion
9	Project work and investigation
10	Teaching reading, writing, and numeracy across the curriculum
11	Using digital and mobile technology for effective teaching and learning
12	The tutor as a researcher

Figure 1. The themes covered in the professional development programme.

Key Elements of the Programme

There are a number of ideas that cut across the PD programme that are worth drawing out.

The Plan - Teach - Reflect cycle. The Plan-Teach-Reflect cycle is built into our materials as part of our sequences of Example - Plan and Practise Together - Teach - Reflect Together.



The Reflect Together section, while presented logically at the end of the teaching strategy, takes place at the start of the next session. The reflection should bring up some interesting and perhaps even surprising issues. However, do not be despondent if the reflection does not always go well: continue with it. Being a reflective practitioner takes time to develop, and this will all fall into place.

The Activity Plan. Each teaching strategy closes with a few activity plans, which are used during the sessions to plan activities. Perhaps some participants do not want to “spoil” their books, by writing in them. However, your own additions are important, and part of your learning journey. They are more important than what is written in the books, so just write them straight into your books. Remember also that the activity plan has a section for post-lesson observation. Please fill this in, and use it during the reflection.

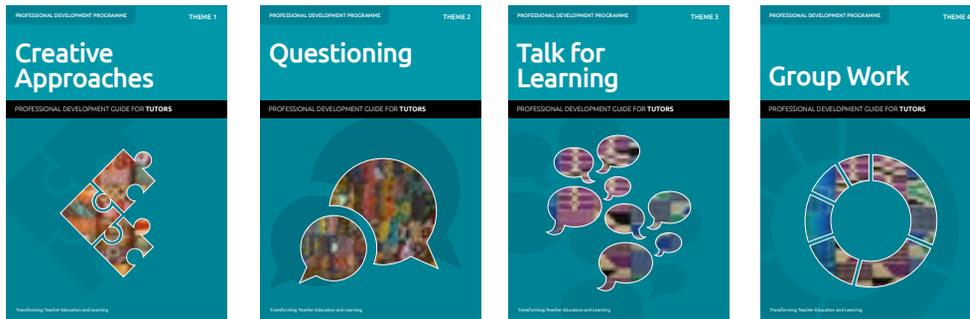
The Learning Journal. The learning journal is an important tool, and we encourage all participants to keep one. It allows you to make notes, so that you can look back at earlier sessions, to see how your thinking and practice have developed.

Digital copies of the materials. Also note that digital copies of all materials are available at <http://oer.t-tel.org>.

The T-TEL Materials and Their Uses

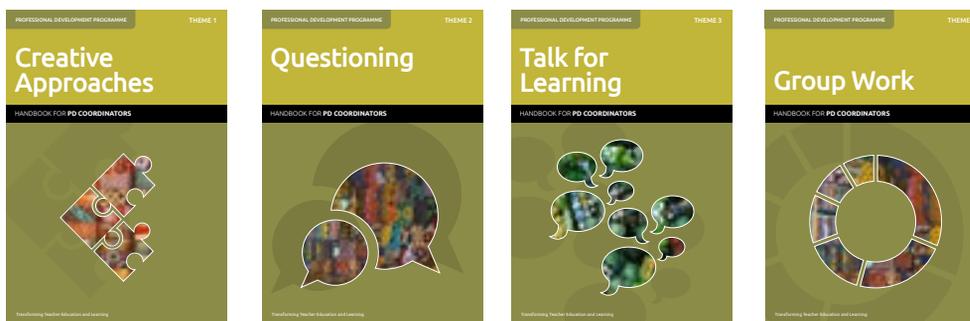
The PD Guide for Tutors

The PD Guide for Tutors are materials for tutors in College of Education, to explore interactive approaches to subject teaching.



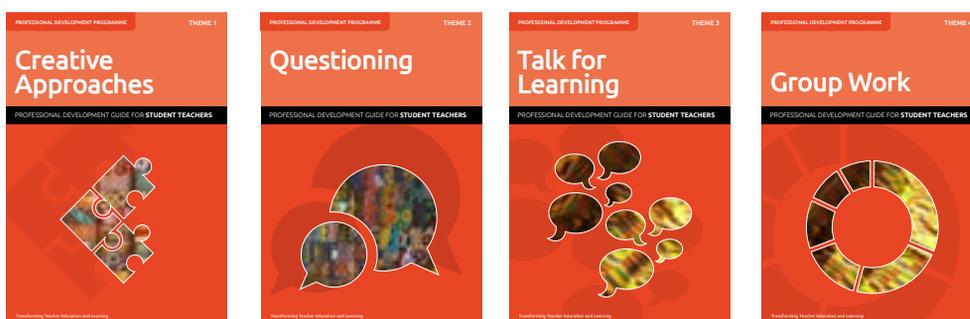
The Handbook for PDCs

The PD Guide for Tutors is accompanied by the Handbook for PDCs, which provides further details on running professional development sessions.



The Student Teacher Versions, Methodology Lessons, and Teaching Practice

In addition to the PD Guide for Tutors, there is a student teacher version available: The PD Guide for Student Teachers.



The PD Guide for Student Teachers follows the PD Guide for Tutors very closely. However, while the PD Guide for Tutors is aimed at tutors teaching student teachers in college, the PD Guide for Student Teachers is aimed at student teachers teaching pupils in school (primary or JHS). The PD Guide for Student Teachers may be of interest to methodology tutors, and could easily be used as a textbook for practice-oriented methodology lessons. You may want to make student teachers aware that these versions are available digitally.

	Participants in professional development sessions	Focus	Professional development sessions led by
PD Guide for Tutors	Tutors	Teaching at college (in particular subject teaching)	PDCs
PD Guide for Student Teachers	Student Teachers	Teaching in primary or JHS	Tutors, school-based mentors, other teachers (peer facilitation)
Teaching Practice Materials	Student Teachers	Teaching Practice in college (Years 1-3)	Tutors and mentors

Figure 2. Overview of materials relating to tutor professional development, student teacher education, and teaching practice.

Also note that a separate series of books is available focusing on teaching practice. They focus on similar pedagogical approaches, but approach these in the setting of the teaching practice within colleges.



The Student Teacher Versions and Local Teachers

The PD Guide for Student Teachers could also be used for self-study by (groups of) in-service teachers. Research shows that such extended professional development programmes are an effective means of achieving improved learning outcomes, and we encourage you to review the additional materials available, detailing the elements of the professional development programme itself. If you happen to be reading these materials as a teacher, already working in a school, we hope that you will find these materials useful. We do use the terms 'student teacher' and 'teacher' interchangeably

- please simply substitute 'teacher' for 'student teacher' - and the materials should make sense to you.

If no college-wide or school-wide programme is available to you, we recommend that, at the very least, you work together with other (student) teachers in self-organised study groups. There is good evidence for the importance of learning together in 'communities of practice', and you will be able to gain the most from the materials in that way.

Introduction to Theme 3

Talk for Learning

This theme focuses on exploring Talk for Learning as an effective pedagogical tool for learning. It will give you insights into:

- How encouraging pupils to talk in the college classroom can help them to learn more effectively.
- Teaching Strategies to encourage your pupils to use Talk for Learning.
- How these teaching strategies help English Language Learning pupils.

Talk for Learning means encouraging pupils to engage in their learning through talking. The talk should be meaningful and enable pupils to progress from recall and memorisation, to thinking and understanding, analysis and creativity.

This theme continues on from our previous two themes (Creative Approaches and Questioning). Questioning is a particular form of talk, and you might want to review the classroom ideas that you have encountered previously.

Why Use Talk for Learning in Your Teaching?

Education research has shown that talking purposefully is an effective tool for learning. For example, in the Education Endowment Foundation's teaching and learning toolkit, 'oral language interventions' has one of the highest impacts for low cost, based on extensive research evidence. Some of the reasons for this are that Talk for Learning can help you to:

- **Develop understanding.** Verbalising your thinking means you have to organise your thoughts and you have to become actively involved. Some (Bruner, 1990; Lacan, 1986) even argue that the mind is actually structured as language and so talking for learning activities support your mind in making sense and developing understanding.
- **Learn through social interaction** because it requires you to interact and talk about what you are thinking with one another in a specific learning context. Questions can be posed, ideas can be challenged and misunderstandings can be heard and corrected. In this way it fits with the learning theories of constructivism and social constructivism.
- **Better recall** of something you have been actively involved in (remembering). Talk for Learning activities require you to do so by thinking about ideas and communicating them.
- **Rehearse and express yourself in English.** Talk for Learning activities give English Language Learning pupils the opportunity to rehearse and practise expressing themselves in English language learning. This might involve identifying words and expressions, using them in

different contexts and phrases, and giving meaning to the words and expressions. To learn a language effectively you need to regularly hear it, see it, read it, write it, and practise speaking it repeatedly.

Will Any Talking in the Classroom Do?

Sometimes teachers will be reluctant to use talking for learning activities because they fear the pupils might be talking, but not actually learning. That is a valid concern that can be addressed by planning activities using teaching strategies that initiate effective talk. You and your colleagues might have experienced different kinds of talking in the classroom. A common classification used in Talk for Learning considers the three different types of talk usually known as:

1. disputational talk,
2. cumulative talk,
3. exploratory talk.

These are explained in more detail in the following box.

Three Different Types of Talk

(1) Disputational talk, in which

- there is a lot of disagreement and everyone just makes their own decisions.
- there are few attempts to pool resources, or to offer constructive criticism.
- there are often a lot of interactions of the 'Yes it is! - No it's not!' kind.
- the atmosphere is competitive rather than co-operative.

(2) Cumulative talk, in which

- everyone simply accepts and agrees with what other people say.
- people use talk to share knowledge, but do so in an uncritical (i.e. unquestioning) way.
- people repeat and elaborate on each other's ideas, but don't evaluate them carefully.

(3) Exploratory talk, in which

- everyone listens actively.
- people ask questions.
- people share relevant information.
- ideas may be challenged.
- reasons are given for challenges.
- contributions build on what has gone before.
- everyone is encouraged to contribute.
- ideas and opinions are treated with respect.
- there is an atmosphere of trust.
- there is a sense of shared purpose.
- the group seeks agreement for joint decisions.

Attribution: Neil Mercer (2008), "Three kinds of talk", available under Creative Commons Attribution ShareAlike 4.0. Extracted from Neil Mercer (2008), "5 examples of talk in group", http://thinkingtogether.educ.cam.ac.uk/resources/5_examples_of_talk_in_groups.pdf.

Planning Talk for Learning

To create lessons that encourage pupils to talk about their learning will not always be easy. However, if successful, they will be stimulating for both pupils and teachers alike. The lessons will require teachers to:

- develop a clear plan and structure for the lessons;
- accept changes in their own roles from 'controller' to 'facilitator';
- know when and how to use Talk for Learning;
- be able to fully engage with their pupils;
- give guidance to their pupils;

- establish routines with their pupils to learn co-operatively.



Figure 3. Talk in the classroom

Theme Overview: Talk for Learning

The teaching strategies discussed in this theme aim to give you lots of ideas to develop and use Talk for Learning effectively in your college classroom. They are:

- T3-1. Initiating talk for learning;
- T3-2. Building on what others say;
- T3-3. Managing talk for learning;
- T3-4. Structuring talk for learning;
- T3-5. Expressing yourself with new words.

Our starting point is to see how you might **initiate Talk for Learning (T3-1)**, bearing in mind that many of your pupils may not be used to talking to each other in the classroom. We will consider strategies like talking tokens, and Think-Pair-Share, that will help your students to start talking. As we mentioned above, we then want to channel talk in a constructive direction, so we will consider how students can **build on what others say (T3-2)**. Once your students are talking, we will consider how you can **manage talk (T3-3)** as well as **structure the talk (T3-4)**, so that learning objectives are not lost, and all students can follow. Finally, we will consider how to support students in learning **new words (T3-5)**. Further details can be found in the tables at the end of this section.

Working Across the Curriculum

The present material is suitable for teachers from all departments in Colleges of Education. Currently, Ghanaian Colleges of Education are divided into the following departments (with some of the subjects in brackets):

1. Language (English, GHL, French)
2. Mathematics and ICT
3. Sciences (Physics, Chemistry, Biology, Physical Education)
4. Social Sciences (Social Studies, Religious and Moral Education, Music & Dance and HIV/AIDS)
5. Arts & Vocational studies (Arts, Catering, Sewing, Bead making and Leather work)
6. Educational Studies

Each introduction to a teaching strategy is followed by three Example-Plan-Teach-Reflection sequences (Strands A, B, C), that focus on different aspects of the teaching strategy. Each section is suitable for all teachers, and you should select one according to your preferences. You will of course still find some examples for English, mathematics, and science, among many examples from other subjects.

Focus on Gender



As discussed, many of your pupils may not be used to talking in the classroom. This is particularly the case for females as much of the teaching that they experience during their basic and secondary education is largely biased towards males. For example, many teachers call on boys because they put their hands up first. Unfortunately, teachers do not stop to think about how girls are often socialised to not be assertive, to not speak out or make mistakes. This leaves girls fearful or reluctant to speak and boys dominating the learning process. This situation is made worse when girls sit at the back of the class, making them even less likely to participate. When girls speak less, teachers tend to consciously or unconsciously think that boys are more clever and able. This belief can come out in teachers' attitudes and behaviours in class, further reinforcing boys' dominance and girls' lack of confidence. If you find that the female pupils in your class are less vocal, it could be because they have experienced this type of treatment for the last 12 years of their schooling.

That said, the teaching strategies discussed in this theme will not only help you to facilitate learning through student talk, but they will do so in a way that breaks the cycle of male bias in the classroom, and brings out the best in your female pupils.

Theme 3: Talk for Learning Teaching Strategies		
Teaching Strategy		Main points
T3-1	Initiating Talk for Learning	To use talk as an effective tool for learning you need something to talk about. This teaching strategy explores developing activities that will encourage good quality discussion. For example: Talking tokens; Activity ball or Magic microphone; Think-Pair-Share; changing partners.
T3-2	Building on What Others Say	This teaching strategy explores how to involve all pupils in learning from each other and to build on what is said. For example brainstorming, concept cartoons.
T3-3	Managing Talk for Learning	This teaching strategy looks at how to develop ways of working together and regulating talk to help you manage Talk for Learning in your classroom. For example Think-Pair-Share, Talking tokens.
T3-4	Structuring Talk for Learning	This teaching strategy introduces strategies to structure the many ideas that are being shared by your pupils when using Talk for Learning. For example concept mapping, diamond nine.
T3-5	Expressing Yourself With New Words	This teaching strategy discusses strategies to deal with language learning aspects of new vocabulary in Talk for Learning. This is relevant to all pupil but particularly for those who are English Language Learners (ELL). For example Talk like an Expert, word walls.

Where to Find Various Aspects

Theme 3: Talk for Learning Teaching Strategies and Aspects				
Teaching Strategy		English	Mathematics	Science
T3-1	Initiating Talk for Learning	Ordering Matching	'Always, Sometimes, Never True' "Convince Yourself"	Talking Points
T3-2	Building on What Others Say	Pyramid	Brainwriting and Brainstorming	Concept Cartoons
T3-3	Managing Talk for Learning	Work arrangements	Think-Pair- Share	Talking Tokens
T3-4	Structuring Talk for Learning	KWL	'Three things we know/we do not know'	PMI
T3-5	Expressing Yourself With New Words	Dealing with new words	Developing a personal mathematical dictionary	Talk like an Expert

Further Reading



OER4Schoos, *Dialogic Teaching*, http://oer.educ.cam.ac.uk/wiki/Teaching_Approaches/Dialogic_teaching

OER4Schoos, *Whole Class Dialogue*, http://oer.educ.cam.ac.uk/wiki/Teaching_Approaches/Whole_class

Education Endowment Foundation Toolkit, *Oral Language Interventions*, <https://educationendowmentfoundation.org.uk/toolkit/toolkit-a-z/oral-language-interventions/>

References

Bruner, J. 1990. *Acts of Meaning*. Harvard University Press, Cambridge, Massachusetts, USA

Lacan, J. 1986. *The Four Fundamental Concepts of Psycho-Analysis*. Edited by Miller, J. (translated by Sheridan, A). Penguin Books, London. First published 1979

Neil Mercer (2008), "5 examples of talk in group", http://thinkingtogether.educ.cam.ac.uk/resources/5_examples_of_talk_in_groups.pdf

The Centre for Research in Education and Educational Technology, *Thinking Together in the Primary Classroom*, <http://www.open.ac.uk/creet/main/sites/www.open.ac.uk.creet.main/files/08%20Thinking%20Together.pdf>.

Sources



TESS-India, “Key resource: talk for learning”, <http://www.open.edu/openlearnworks/mod/oucontent/view.php?id=56846§ion=3>, available under Creative Commons Attribution-ShareAlike (<http://creativecommons.org/licenses/by-sa/3.0/>; unless identified otherwise).

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OER4Schools, Dialogic Teaching, http://oer.educ.cam.ac.uk/wiki/Teaching_Approaches/Dialogic_teaching, available under Creative Commons Attribution-ShareAlike 4.0

Els De Geest (2007), “Many Right Answers: Learning in Mathematics through Speaking and Listening” <http://shop.niace.org.uk/media/catalog/product/m/a/manyrightanswers.pdf> (Crown Copyright)

Neil Mercer (2008), “Three kinds of talk”, available under Creative Commons Attribution ShareAlike 4.0. Extracted from Neil Mercer (2008), “5 examples of talk in group”, http://thinkingtogether.educ.cam.ac.uk/resources/5_examples_of_talk_in_groups.pdf.

Introduction to Teaching Strategy 1

Initiating Talk for Learning

T3-1 i 1 Learning Objectives



By the end of the session teachers will be able to:

- Plan activities that can be used in any subject to encourage Talk for Learning with their pupils, especially females.
- Use/practise these teaching strategies to help their pupils learn more effectively.
- Engage pupils in their own learning.

T3-1 i 2 Introduction



To use talk as an effective tool for learning you need something to talk about. This teaching strategy explores some activities that can help you in developing activities with your pupils that will trigger good quality discussions that allow for 'learning through talking' to happen, whatever the subject area or topic.

Getting your pupils to talk in a way that really helps their learning can be challenging and requires good planning of activities that will stimulate such focused discussions and learning.

In the table below are ideas for such activities that will be considered more closely. They can be used and adapted for many topics, and all subjects. They fall mainly into three categories: activities that ask pupils to:

- Agree or disagree with given statements, e.g. 'Talking Points'; 'Sometimes, Always, Never True'.
- Develop and refine a narrative, eg 'Convince Yourself, Convince a Friend, Convince a Scholar'; 'Being a Radio Reporter'; 'Finish Stories/ Narratives'; 'Predict What Happens Next'
- Negotiate and persuade through working together on activities that require finding connections/collocations.

Theme 3: Talk for Learning Teaching Strategy 1: Initiating Talk for Learning		
Aspect	How it works	Section
Always, Sometimes, Never True	Statements are listed and pupils have to decide whether these statements are always true, sometimes true or never true.	T3-1M
Convince Yourself, Convince a Friend, Convince a Famous Scholar	Pupils re-visit their arguments and re-phrase them with increasing sophistication and precision.	T3-1M
Cumulative Talk	In cumulative talk pupils repeat and elaborate each other's ideas, in an uncritical (i.e.unquestioning) way.	T3-1i
Matching Cards	Pupils are asked to work in pairs or small groups to match cards and discuss why they match.	T3-1E
Ordering Cards	Facts that can be ordered, but do not always have a straightforward answer, are written on cards. Pupils, working in groups or pairs, have to order these.	T3-1E
Talking Points	Talking points are deliberately thought-provoking statements for discussion and reasoning in small groups	T3-1S
You, the Radio Reporter	This is a variation on writing a newspaper article: this time the pupils are radio reporters so they need to talk.	T3.1i

The strands give examples and ideas for using the aspects with a wide range of subjects, including

- Educational Studies
- English
- Environmental and Social Studies
- ICT
- Integrated Science
- Mathematics
- P.E.
- Pre-Vocational Education
- Religious and Moral Education
- Social Studies

The aspects covered can be used and adapted for many topics, and all subjects. Here are some possibilities to consider.

Always, Sometimes, Never True

Statements are listed and pupils have to decide whether these statements are always true, sometimes true or never true. For example, ask pupils which of the following statements are always, sometimes, or never true:

- Mammals can fly.
- N chords of a circle divide the circular region into $N + 1$ non-overlapping regions.
- If a number is odd, it is also a prime number.
- Molecules are also compounds.
- Liquids freeze at 0°C .

Convince Yourself, Convince a Friend, Convince a Famous Scholar

This works well as a follow-up to the previous activities. It requires the pupils to re-visit their arguments and re-phrase them with increasing sophistication and precision. For example: Ask pupils to “Convince yourself, convince your neighbour in the class, convince Prof Allotey” of your views on the mathematical and science statements from activity ‘Always, Sometimes, Never True’ (T3-1B).

Cumulative Talk

In cumulative talk pupils repeat and elaborate on each other's ideas, in an uncritical (i.e. unquestioning) way. Everyone accepts and agrees with what other people say. It promotes whole class harmony and allows pupils to increase in confidence as they speak without being challenged at first. For example: Try out cumulative talk by asking pupils to create a class story, contributing one line each about welcoming to the class a new pupil who is deaf. The first sentence could be “Yesterday, I met a dedicated new pupil, Mary.”

Matching Cards

Pupils are asked to work in pairs or small groups to match cards and discuss why they match. This activity is commonly used in language and literature lessons and is called ‘Pelmanism’; it can be used to show relationships between words. Good discussions come from having examples that have multiple or not straightforward answers.

For example: Give pupils a card sort that consists of two types of cards: some with graphs and some with descriptions. Ask the pupils to look at a graph card, and to discuss and agree with which descriptor card it can be paired.

Ordering Cards

Facts that can be ordered, but which do not always have a straightforward answer, are written on cards. Pupils have to order these, working in groups

or pairs. Ordering is an excellent way of helping pupils to understand sequencing and signposting in language so can be very useful for storytelling, debate, presentations, reading and writing.

For example:

- Ask pupils to order the following in terms of the probability that they will happen: tomorrow it will rain; getting tails when tossing a coin; getting an 'A' for my English essay; eating fufu this week;....
- Use cut up stories with useful signposting language that can help pupils re-order the story. To encourage Talk for Learning, do not finish the story, the pupils will have to make up the ending or discuss what happens next in the story.

Talking Points

Talking points are deliberately thought-provoking statements for discussion and reasoning in small groups. For example, you can ask pupils to discuss whether the following statements are 'true', 'false' or 'not sure'. Ask the pupils to explain their reasoning. Here are the statements:

- The next president of Ghana will be female.
- Girls are naturally inclined to be better at languages and worse at science and maths than boys.
- Volume and capacity are the same.
- The number -4 is greater than -3.

You, the Radio Reporter

This is a variation on writing a newspaper article: this time the pupils are radio reporters so they need to talk. For example: Give a distance-time graph of the final two competitors (one male, one female, female winning) racing each other in the Tro Tro Racing Championships. Ask the pupils to provide the life commentary of the race for the radio.



Figure 4. Talk for Learning among students

T3-1 i 3 Using These Aspects in a Gender-Responsive Way



Many of the strategies discussed above involve some sort of small group work, pair work and/or calling on individual pupils. Here are some tips on how to use these strategies while building female students' confidence and opportunities to speak.

1. Be conscious of the number of questions asked/answered by males and females and the amount of attention you give: if males speak more, you should make an extra effort to encourage females to speak more.
2. Be patient with females and males who may be shy or afraid to talk: understand that this is often due to low levels of self-confidence, so ensure that pupils, especially females, are given time to think and answer a question before moving on to another student.
3. Experiment with different student groupings to find which are the most comfortable and effective.

In terms of the last point on experimenting with different pupil groupings to find which are the most comfortable and effective, you can try:

- All female groups - females tend to enjoy and benefit from a non-competitive, collaborative dynamic of working with other females.

However, females and males should still learn to participate and work together equally. One strategy is to start with separate female and male groupings and transition into mixed groups gradually, while also setting ground rules for equal speaking and leadership roles.

- Groups in which there are mostly females, and 1 or 2 males – as you transition towards mixed groups, make sure to establish the rule that all members of a group should be able to speak and participate – no-one (female or male) should dominate.
- Mixed groups – ensure equal speaking and participation rules are followed and make sure to assign leadership roles to females (especially if there are fewer females in the class).

Please bear these points in mind across all the teaching strategies in this theme, and throughout your teaching.

T3-1 i 4 **Activity: Talking Points**



In small groups, talk to your teacher colleagues about each of the activity types suggested. Then choose two of the following Talking Point statements and discuss these one by one in your groups:

- The next president of Ghana will be female.
- Girls tend to perform poorly at science and maths because they are not encouraged or supported as much as boys are.
- Volume and capacity are the same.
- The number -4 is greater than -3.

Teacher Discussion

After the activity, discuss with your colleagues:

- Do these activities make you talk?
- Do you think they make you talk in such a way that it helps learning?

Make notes of your ideas in your learning journal.

T3-1 i 5 **Plan and Practise Together**



The next three sections have examples of different activities to initiate Talk for Learning that can be used in all subjects. In your own planning, please use the introduction above if you need further information on the various aspects. Also note that the example provided in each section is just for guidance. Do not spend too long on it, but move straight on to your planning activity.

You can also find more classroom ideas that offer good talking for learning ideas in our previous themes (Creative Approaches, Questioning).

T3-1 i 6 Prepare for Teach and Reflect



Once you have planned your activity, come back together as a whole group, to see what issues arose. Make a note in your learning journal. After you have taught, write down your own observations and reflections on your activity plan and in your learning journal, and be prepared to share these with others at the start of the next session.

T3-1 i 7 Sources



TESS-India, *Developing mathematical reasoning: mathematical proof*, http://www.open.edu/openlearnworks/pluginfile.php/134971/mod_resource/content/3/SM02_V2_PDF.pdf, available under Creative Commons Attribution-ShareAlike (<http://creativecommons.org/licenses/by-sa/3.0/>; unless identified otherwise).

TESS-India, *Comparing and contrasting tasks: volume and capacity*, http://www.open.edu/openlearnworks/pluginfile.php/134947/mod_resource/content/2/EM09_V2_PDF.pdf, available under Creative Commons Attribution-ShareAlike (<http://creativecommons.org/licenses/by-sa/3.0/>; unless identified otherwise).

OER4schools, *Talking Points*, http://oer.educ.cam.ac.uk/wiki/OER4Schools/activities/Talking_points, available under Creative Commons Attribution-ShareAlike 4.0.

OER4schools, *Cumulative Talk*, http://oer.educ.cam.ac.uk/wiki/OER4Schools/Introduction_to_whole_class_dialogue_and_effective_questioning, available under Creative Commons Attribution-ShareAlike 4.0.



Teaching Strategy 1

Initiating Talk for Learning in English

T3-1 E 1 Example



Using Ordering and Matching to Initiate Talk for Learning in English

In this example section, we are going to look at two teaching activities that you can use in the classroom, called 'Ordering' and 'Matching'. 'Ordering' and 'Matching' can be used as prompts for Talk for Learning, in that they encourage talk for...

- negotiating e.g. I think this should go there because it will;
- agreeing/disagreeing e.g. I think this is a match because ... yes so do I, no, I don't because...
- explaining e.g. This has to go next because...

In addition these activities can be expanded upon to extend the Talk for Learning, for example:

- In '**Ordering**' use stories where pupils have to create the ending or when introducing processes, where pupils have to describe each stage of the process.
- In '**Matching**', extend the Talk for Learning by getting pupils to talk further about their 'matches' e.g. advantages/disadvantages; likes/dislikes; giving more examples of similar 'matches' and so on.

Both activities can be organised as whole class (using the board as the prompt with cards stuck on the board); teams (competition); pair work (if you have smaller classes as this will mean more resources); group work.

Now let's first look at 'Ordering'. Here is a story that can be used for an 'Ordering,' activity. Read the story and instructions, then discuss the questions after the text either in pairs or groups.

Ordering

The example below can be used in conjunction with the Primary English Language Syllabus (4-5), Section 1, Unit 2: Storytelling.

Preparation: You will need to copy the story below several times, one for each group of pupils. Cut up each copy of the story into strips and mix them up. You might want to use paper clips to keep each set of strips together, so that they do not accidentally mix.

Instructions for the classroom activity:

- Organise your pupils into small groups.
- Give each group the mixed up story.
- Ask the groups to reorder the strips to make a story.

It was a dark, dark night.
The Mensah family was fast asleep.
Their little boy, Halifax, woke up because he heard a noise.
He got up and walked into the living room.
When he got there
he found a man sitting in a chair.
The man was friendly and they played a game together.
In the game, they put all the valuable things in the house in the man's bag.
Halifax thought it was fun
So he helped the man a lot.
Then the friendly man said goodbye.
Halifax went back to bed and fell fast asleep.

Teacher Discussion

- How can you make this activity promote Talk for Learning?
- What further questions might you ask your pupils to stimulate further Talk for Learning using the re-ordered story?
- How can this be used in English language lessons to practise grammar items? What other areas of the English syllabus could you use it for?
- What other subjects could you use this re-ordering activity with? What topics for discussion might come from the story?

Matching

Here are the instructions for a game. Read them, and then do the tasks following the game. (Note that this activity was also introduced in 'Games', ST1-1 E, and is called 'Pelmanism'). Use your English Language Syllabus. This example is based on Unit 4, Tense forms, JHS1.

Pelmanism

Prepare 10 cards with numbers on one side and sentence patterns on the other, as follows:

Front of cards

1	2	3	4	5
6	7	8	9	10

Back of cards

go	sleep	buy	eat	see
bought	went	saw	slept	ate

Instructions

- Stick the cards on the blackboard so that the pupils can only see the numbers.
- Divide the pupils into two teams and ask them to choose two numbers.
- Turn the cards over and see if they have guessed a match e.g. go = went.
- If they have, give the pair to the team. If not, turn the cards over again and continue until all the cards are finished.

The idea is that the pupils have to remember what is where and then create more original sentences using the verbs and tenses. It could be made into a competition after they have completed the matching, the groups have to come up with as many different sentences as possible using the different verbs and tenses. In this way they have to think of the tense and verb in the sentence, thereby Talk for Learning.

Teacher Discussion

How can this 'Matching' activity stimulate more Talk for Learning? Write some of your ideas here:



T3-1 E 2 Plan and Practise Together



Ordering and Matching

You are now going to plan your own 'Ordering' or 'Matching' activity. If the above examples fit what you are teaching, you can use them. However, you may well be teaching something else, so here are some more ideas from various subjects that lend themselves to 'Ordering or Matching'.

Water Cycle (Upper Primary Integrated Science Syllabus - Primary 5, Unit 1)

Put the stages of a 'Water Cycle' (evaporation, transpiration, condensation, precipitation) on cards and ask each group of pupils to organise them in the order they think they should be. Some may come up with a linear arrangement, some might make a cyclical one. Whichever approach and order they take, it should be a rational order. Ask pupils to give their rationale for their order and say what happens at each stage. This will help them in Talk for Learning as they have to give their reasoning for each order/stage and how they link.

Letter Writing (Primary English Syllabus - Primary 6, Section 4, Unit 3)

Take the layout of a semi-official letter and put the different elements on slips of paper. Ask pupils to put them in order. They have to give/argue reasons why they have chosen such an order. This can be done individually, in pairs or in groups, so you can get feedback as a whole class or as pair/group work.

Shape and Space (JHS Maths Syllabus - Section 4, Unit 4.11)

In groups plan on how to use 'Matching' to initiate Talk for Learning using the steps given at the example stage e.g to identify everyday life objects which have angles more/less than a right angle and equal to a right- angle.

After the 'Matching' activity ask each group to discuss in what situations is it important to understand about angles and why is it important to relate them to real objects?

Diversity of Matter (JHS 1 Integrated Science: Section 1, Unit 1)

In groups plan on how to use 'Matching' to initiate Talk for Learning using the steps given at the example stage.

Use the 'Diversity of Matter' to think of a matching activity with pictures and words e.g. different states of matter. Then think about how to follow up the matching activity with Talk for Learning about 'Diversity of Matter.'

Counting Objects (Primary Maths Syllabus 1, Unit 1.1)

Using this material develop a 'Matching' activity. Use one-to-one matching or match number names with given group of objects. Use the questions from the syllabus to encourage pupils to discuss in groups to further Talk for Learning.

Plan Your Own Activity



Can you use any of the above ideas? Hopefully the above topics give you an idea of how you can use design an activity for use in your classroom. But, as usual, it is possible that those ideas do not fit, and you will need to identify a topic that fits into your weekly lesson forecast.



At the end of the planning activity you should have developed an activity plan that you can use in your teaching in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.

T3-1 E 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-1 E 4 Reflect Together



Ordering and Matching

Now that you have taught the lesson, using either or both, 'Ordering' and 'Matching' with your pupils, get into different subject groups to share your experiences. Use the questions below to guide your reflective discussion:

- Did you write any notes after your lesson as a self assessment and to recall the 'Ordering' or 'Matching' activities?
- Can you say what percentage of time was teacher talking time and how much was pupil talking time during the activity you used/chose?
- How did the 'Ordering' and 'Matching' activities help pupils to talk and learn more? Share the different ideas from the different subjects and record them either on a poster or in your learner journals.

T3-1 E 5 Further Resources



Initiating Talk for Learning

Here is an old but very good book for more activities to get your pupils to talk more, in a meaningful way, in your English classes. It is still in publication.

Klippel, F. (1985), *Keep Talking - Communicative fluency activities for language teaching*, Cambridge University Press

Teaching Strategy 1

Initiating Talk for Learning in Mathematics

T3-1 M 1 Example



How Teacher Hamida Convinced Professor Allotey in Mathematics

In this example, teacher Hamida uses 'Always, Sometimes, Never True' and 'Convince Yourself, a Friend, Prof Allotey' to initiate Talk for Learning in her classroom. There are many statements (in life, and in mathematics) that are always true, sometimes true, and never true. It can be difficult to figure out which category a statement belongs to, and mathematicians spend a lot of their time trying to work this out. For some hard problems in mathematics, this can take many years to work out, and for many problems we still do not know for sure. In working this out, it helps to talk to others, and to try to convince others. Often, we may be convinced ourselves, but talking it through with a friend may change that. Talking to an eminent scholar like Professor Allotey may make us think even harder about arguments. The example focuses on how to use activities to stimulate Talk for Learning in mathematics. You can find more ideas that can be adapted to a mathematics learning context in the overall introduction section of Talk for Learning, and in the science and English sections.

Teacher Hamida teaches in a school in the northern region of Ghana. She thinks her pupils get little opportunity to practise their mathematical reasoning and some of her students find giving explanations in English not straightforward. She decides that it would be a good idea to give them more opportunities for talking about maths. She uses two activities in succession: 'Always, Sometimes, Never True' followed by 'Convince Yourself, Convince a Friend, Convince Prof Allotey'. These are her reflections.

I wanted to revise some concepts about addition and subtraction of numbers 0 to 99. (Primary mathematics syllabus, unit 1.12), and wrote down statements related to that. Finding the statements was not too difficult. Some of them I got from the textbook, some were related to exam questions, some I invented myself.

I told my pupils to read the statements I had written on the board. I asked them to discuss which of these are always true, sometimes true or never true, and why.

Here are the statements:

The next whole number after 19 is 20
Doubling a single digit number will give a two digit number
Subtracting 10 from a two digit number will change both digits
Adding 25 to any number will change both digits

After about 15 minutes I moved them onto the 'Convince Yourself, Convince a Friend, Convince Prof Allotey' activity. I told them:

- Remember that Professor Allotey will try and pick holes in your reasoning.
- Redo the activity, but instead of simply discussing your reasoning with your partner, you now have to come up with reasoning that will:
 - convince yourself;
 - convince a friend;
 - convince Prof Allotey.
- You will be invited to share your most convincing justification with the class. Will the other pupils be convinced by your argument/what you say?

After the teaching, teacher Hamida reflects on how it went.

I was a bit scared about trying out this activity for several reasons:

- the unusual structure of the activity;
- requiring the pupils to develop their own reasoning;
- pupils would be talking to each other when this is not usually allowed in my classroom.

To my surprise it worked really well! The classroom did not end in chaos. There was noise from the talking in pairs, but it was not loud. What I liked very much was that the conversations were about mathematics, and that disagreements led to pointed discussions about the mathematical operations and place value. When the pupils were invited to share their best arguments to convince a room full of Professor Alloteys, I was impressed with the quality of the mathematical language and reasoning used. What I found very hard in this lesson was my changed role as teacher: I was no longer standing at the front explaining and telling them what to do. However, it meant that this was now their learning and their thinking, which was a powerful experience.

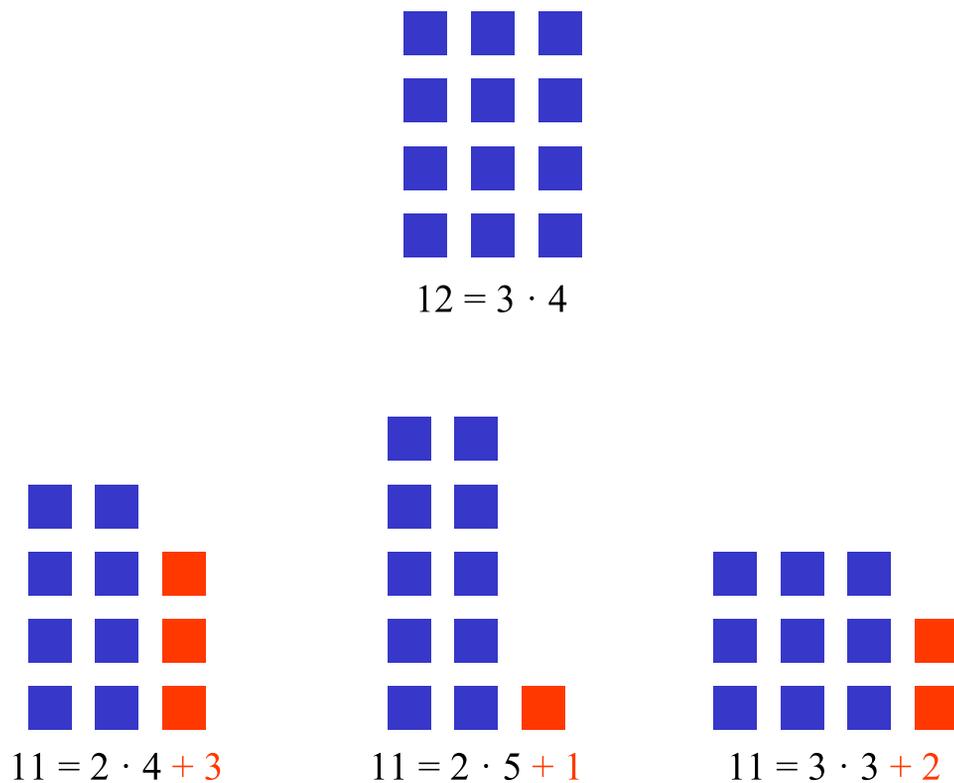


Figure 5. The number 12 is not a prime, as 12 items can be placed into 3 equal-size columns of 4 each (among other ways). 11 items cannot be all placed into several equal-size columns of more than 1 item each without some extra items leftover (a remainder). Therefore, the number 11 is a prime.

Teacher Discussion

Discuss with your colleagues:

- What do you think about the activities Hamida selected to work on getting her pupils to learn through talking? Would they work with your pupils? Would you have changed anything? What are the advantages and disadvantages of using Talk for Learning approaches for mathematics learning?
- Make a note of your thoughts in your learning journal.

T3-1 M 2 Plan and Practise Together



Always, Sometimes, Never True and Convince Yourself, Convince a Friend

The above example might not work for you, so here are six more statements that lend themselves to using the same strategies of 'Always, Sometimes,

Never' and 'Convince Yourself, a Friend, a Scholar' to initiate Talk for Learning. You can find many more examples on the internet by searching for 'Always, Sometimes, Never mathematics'.

Ratio and Proportion (Mathematics)

Investigate the statement: *'When two quantities are proportional to each other, one quantity is a multiple of the other'.*

Reference: Primary Mathematics Syllabus 2012, Unit 6.7, pp. 122-124.

Length and Area (Mathematics)

Investigate the statement: *'Polygons with different areas also have different perimeters'.*

Reference: JHS Mathematics Syllabus 2012, Unit 1.5, pp15-17.

Measurement of Time and Money (Mathematics)

Investigate the statement: *'You can pay for some cashew nuts costing GH¢13 by using only GH¢2 notes'.*

Reference: Primary Mathematics Syllabus 2012, Unit 2.9, pp29-30.

Plan Your Own Activity



Can you use any of the above ideas? If not, consult your syllabus and choose a topic from a lesson you will teach next week where you can use 'Always, Sometimes, Never' and 'Convince Yourself, a Friend, a Scholar'.

Here are your planning tasks. Use the activity plan template found in the appendix.

Planning tasks:

1. In groups think of a lesson and a topic that you will teach in the coming week. If the above examples fit, you can use them. Otherwise, pick your own from the syllabus.
2. Come up with statements suitable for 'Always, Sometimes, Never True' and 'Convince Yourself, a Friend, a Scholar'. Remember the aim is to stimulate Talk for Learning with your pupils.
3. Plan the activities in detail.



Please make sure that you have noted down everything you need to remember for your lesson in your activity plan. At the end of the planning activity you should have developed an activity plan that you can teach in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.

T3-1 M 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-1 M 4 Reflect Together



Always, Sometimes, Never True and and Convince Yourself, Convince a Friend

Now that you have taught the lesson activity, reflect on how it went. If at all possible, do the reflection together with a colleague who has also tried the activity.

In your reflection, consider the following questions:

- Did these activities help your pupils to talk mathematically (or to reason better if you did the activity in other subjects)?
- Is there any difference in the learning of the pupils from the strategies you tried out in these lessons from what you normally do?
- If you did the activity in mathematics, how does 'Always, Sometimes, Never True' relate to the idea of mathematical proof?
- Were there any problems/difficulties when you tried this activity, if yes, how can you improve next time?

Remember to write down your thoughts in your learning journal. Note down one or two items which you learned from this section.

T3-1 M 5 Sources



TESS-India, *Developing mathematical reasoning: mathematical proof*, http://www.open.edu/openlearnworks/pluginfile.php/134971/mod_resource/content/3/SM02_V2_PDF.pdf, available under Creative Commons Attribution-ShareAlike (<http://creativecommons.org/licenses/by-sa/3.0/>; unless identified otherwise).

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Theme 3: Talk for Learning

Teaching Strategy 1

Initiating Talk for Learning in Science

T3-1 S 1 Example



Using a Talking Points Activity to Initiate Talk in Science

Have you seen a programme on Ghanaian television called 'Talking Point' where politicians and other influential people discuss topics in the news? Opinions are often strongly held and articulately expressed and the discussions can get quite heated at times when ideas clash. This is especially true when a controversial topic is being discussed.

Teacher Sadiq uses the idea of talking points to stimulate discussion in a similar way with his pupils because he knows that if he can get the pupils talking effectively about science topics he can begin to improve their learning in science.

Teacher Sadiq's Talking Points Activity with Pupils

Teacher Sadiq asks his pupils if they have ever seen the TV programme 'Talking Point'. Some of them have and others said that their parents watch it. After briefly telling his pupils about the programme he writes some talking points related to digestion (their new topic) on the board. He gives the pupils a few minutes to get organised into groups of four or five before instructing them to work through the talking points one at a time in their groups. He tells them they have 15 minutes to work on the activity.

These are the talking points he writes on the board.

Example of talking points for digestion:

- All living things have a digestive system with which complex substances are broken down into simpler substances.
- Blood is part of the digestive system.
- Teeth are essential for digestion.
- You cannot breathe when swallowing.
- The stomach is the most important organ in digestion.
- Your intestines are 50 metres long.
- The appendix is part of the digestive system.

DBE syllabus reference: "Digestion in humans" (FDC 224, *Integrated Science 3*, Biology, Unit 3).

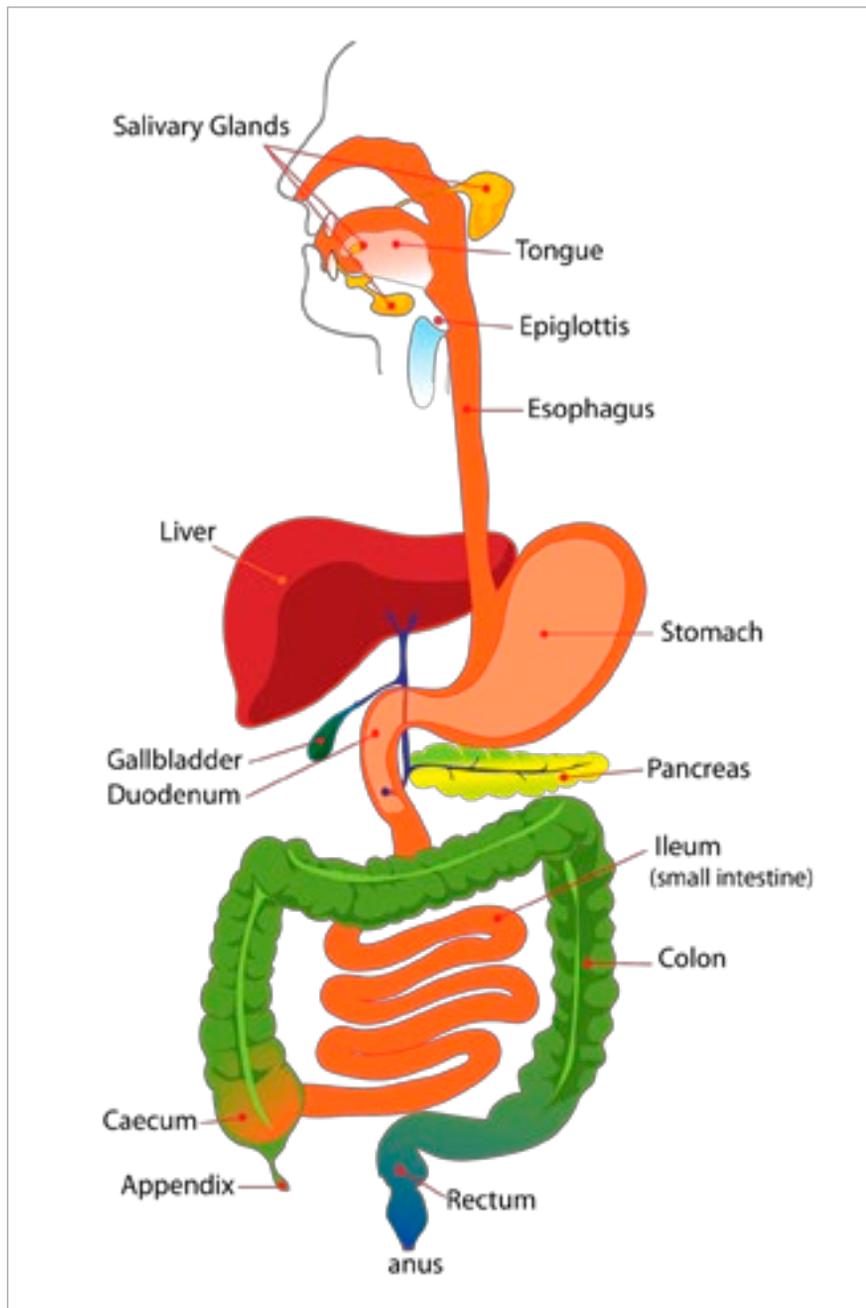


Figure 6. The digestive system in human

Teacher Sadiq describes how he does the activity as follows:

I notice the following when watching one group:

- Each pupil takes a turn to give their opinion.
- When everyone in the group says something about the first talking point they decide together if they agree, disagree or are unsure about it and then they move on to the next one.
- They are prepared to justify their ideas when another member of the group questions them. For example, one pupil asks another “Why do you think that the intestines are less than a metre long?”.

As I walk around the classroom I can see that not every group talks about all the talking points on the list or talks about them in order. However, as long as everyone expresses their opinion and the group reaches a consensus before moving on that does not matter. Across the groups, the pupils generally talk about each point for as long as the discussion continues to be productive. However, one group rather rushes through the talking points without exploring them fully. Because that group finishes very quickly, I divide up the members of this group and assign them to be silent observers of another group each so that next time they have a better idea of how to contribute to the discussion.

After the activity Sadiq holds a whole class plenary session and he asks individuals how their group found the activity and about any interesting points that arose.



Figure 7. Student teachers planning a talking points activity

Teacher Discussion



You will have noticed this statement in the previous extract about teacher Sadiq:

“He knows that if he can get pupils talking effectively about science topics he can begin to improve their learning in science.”

Share your thoughts on how talking about science in groups or during whole class dialogue can lead to improved outcomes for pupils.

When you do a talking points activity with your pupils:

- How will you make them aware of the steps of the activity? Can you write the steps in bullet point form?

- How will you take feedback from groups after the talking points activity? What questions will you ask? Why?
- How will you make sure that everyone participates equally in the activity and discussion, especially females?
- What, if anything, will the pupils write during the activity? Why?

Sadiq wrote the talking points for this activity on the board. What are the advantages and disadvantages of doing it that way? What are the alternatives to writing them on the board?

T3-1 P 2 Plan and Practise Together



Talking Points

You are now going to plan your own talking points activity. The previous example will only work for you if you happen to be teaching about the digestive system, so here are some ways that you can adapt the activity in the example for the year group/s that you will teach.

JHS

The previous example will work for you if you happen to be teaching about the digestive system in JHS.

Reference: National Syllabus for Integrated Science (Junior High School), JHS 3, Section 3: Systems, Unit 3, "Digestion in humans".

Alternatively you can use the following talking points on the reactivity of metals:

- Metals dissolve in acids.
- Metals sink in water
- You cannot burn metals.
- Metals change shape when you hammer them.
- Metals conduct electricity when you melt them.
- You cannot freeze metals.
- All metals rust.
- All metals come from rocks.
- There is metal in your body.
- Metals are magnetic.

Reference: National Syllabus for Integrated Science (Junior High School), JHS 2, Section 1: Diversity of Matter, Unit 2, "Metals and Non-metals".

Upper Primary

Similar talking points to those in the example can be used if you are teaching digestion to primary 6. Replace the first bullet point with this simpler version:

- All living things have a digestive system.

Reference: National Syllabus for Integrated Science (Primary 4-6), Primary 6, Section 3: Systems, Unit 1, "The digestive system of humans".

Lower Primary

There is no digestion topic in lower primary so here are some more general talking points on the human body that you can use:

- Eating food is good for you.
- Running too fast is bad for you.
- Humans have two of every organ.
- Only females can have babies.
- You can't talk and listen at the same time.
- Humans can float in water.
- Your two hands are identical (the same).
- Drinking water makes you fat.
- You stop breathing when you are asleep.
- Girls are cleverer than boys. (not sure about this one)

Reference: National Syllabus for Natural Science (Primary 1-3), Primary 1, Section 3: Systems, Unit 1, "The Human Body".

English

Here are some talking points based on the primary 6 syllabus:

- All poems must have rhythm and rhyme.
- When following written instructions you must always do things in the order they are written.
- All good stories have a moral.
- It is more important to read well than to write well.
- "The cat sat on the mat." is an idiomatic expression. [no, idioms are figurative rather than literal eg. "Has the cat got your tongue?" means "Why are you silent?"]
- There are no mistakes in this sentence: "The dog wagged it's tail." [no, the apostrophe should not be there]

- If I have two sisters and I like to play with their toys I can write: "I like to play with my sister's toys." [no, should be sisters' as he plays with both of their toys, not just one]

Reference: English Language Syllabus 2012, Primary 6, Sections 1, 3 and 4.

Maths

Here are some talking points based on sets of numbers:

- 10 is a factor of all numbers ending in a zero. [except zero]
- All multiples of even numbers are even. [yes]
- All multiples of odd numbers are odd. [no]
- All multiples of 4 are also multiples of 2. [yes]
- All multiples of 3 are also multiples of 6. [no]
- The lowest common multiple of 2 and 3 is 5. [6]
- {1,3,5,7} is a set of prime numbers. [no, 1 is not a prime number]
- There are more prime numbers between zero and 50 than there are between 50 and 100. [15:10]
- The highest common factor of 8 and 12 is 4. [yes]
- The bigger the number the more factors it has. [no]

Reference: Primary Mathematics Syllabus 2012, Unit 6.1, "Sets of Numbers".

Planning Your Own Talking Points Activity



Come up with some talking points (between 5 and 10) on a topic from a lesson you will teach next week. Write them in an activity plan; you can find the activity plan template in the appendix. Also write in your plan other planning details (resources needed etc.) that will help you to do the activity successfully with your pupils.

Plan to take feedback from your pupils after they do the activity. If possible, ask them:

- Which talking point/s generated the most discussion?
- Which talking point/s generated the least discussion?

Make a note of these and we will discuss them as a group in the next session.

At the end of the planning activity you should have developed an activity plan that you can teach in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.



T3-1 S 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-1 S 4 Reflect Together



Talking Points

Now that you have done the talking points activity with your pupils, reflect on how it went. Do the reflection together with colleagues who also tried the activity.

In your reflection, consider the following questions:

- How effective was the talking points activity in getting your pupils talking?
- Did the talking points that you used engage the pupils in the way that you thought they would?
- Did you think male pupils were talking/participating more than female pupils? If so, did you do anything to make things more equal?
- Did the talking points activity move your pupils' learning on? How do you know?
- What makes a good talking point?

Complete the following table with colleagues in your group. Alternatively you can draw this table in your learning journal.



Most successful talking point	Least successful talking point

- Looking at your completed table, are there any patterns? Can you see why some talking points were more successful than others?
- Will you use talking points in the future with your pupils? Will you do anything different next time?

Remember to write down your thoughts in your learning journal. Also note down what you learned from this session that was most effective in improving your teaching.

T3-1 S 5 Sources



Image: "The digestive system in humans" - originally named 'sistema digestivo' by author Leysi24 and available under CC-BY-SA-3.0 here: <https://commons.wikimedia.org/wiki/File:Digestive-system-for-kids.png#file>

Introduction to Teaching Strategy 2

Building on What Others Say

T3-2 i 1 Learning Objectives



By the end of the session teacher will be able to:

- Plan activities that can be used in any subject to support pupil to build on what is said by their peers using Talk for Learning.
- Use these teaching strategies to help pupil learn more effectively.

T3-2 i 2 Introduction



Good, effective Talk for Learning, such as exploratory talk, requires your pupil to engage critically with each other, listen to what their peers are saying, and to build constructively on each other's ideas. Both females and males are actively involved, participate in sharing ideas and feel happy in asking questions and being challenged in order to help develop understanding and learning. This means establishing a classroom ethos where people listen, are non-judgmental, have skills in communicating in a non-threatening way and feel free to contribute ideas. Sometimes it can be helpful to explicitly establish ground rules like these with your students before starting.

The table below offers an overview of strategies that can help you in developing activities that encourage good quality discussions. The activities will invite your pupils to share their ideas, listen to each other and build on what they are saying. They can be used and adapted for many topics, and all subjects. More details about these strategies are given after the overview table.

Theme 3: Talk for Learning Teaching Strategy 2: Building on What Others Say		
Aspect	How it works	Section
Brainstorming and Brainwriting	The aim of Brainstorming is to quickly share as many ideas or opinions as possible by saying them out loud and having someone write them all down. Brainwriting involves writing ideas down before discussing them.	T3-2M
Concept Cartoons	Concept Cartoons are drawings in the format of a cartoon that show different characters (people, animals,...) arguing about a situation that refers to a concept they are learning about. They aim to provoke discussion and thinking.	T3-2S

Pyramid Discussion	The teacher asks pupil to discuss the topic first in pairs, then in fours, then in groups of 8, 16 etc until the whole class is involved in the discussion.	T3-2E
Participatory Feedback	Participatory Feedback strategies make pupil listen actively and add to what others are saying during feedback.	T3-2E

Brainstorming and Brainwriting

The aim of 'Brainstorming' is to quickly share as many ideas or opinions as possible by saying them out loud and having someone write them all down. Here are some potential pitfalls with 'Brainstorming':

- Some people in the group might dominate.
- Early ideas can direct and limit what is offered later – the result of a brainstorm is often 'groupthink' instead of many original ideas. To avoid this, 'Brainstorming' could be done in smaller groups first, and then shared.
- If you have different levels of professional hierarchy in your group, not everyone might be willing to shout out what they really think in the presence of their boss, for example, if your pupil are in a group with teacher/heads of department at school.

There is also 'Brainwriting', where you ask each individual to write down their ideas (for example, on Post-it notes); these are then discussed and categorised in small groups and only then shared with the whole group.

Concept Cartoons

'Concept Cartoons' are drawings in the format of a cartoon that show different characters (people, animals,...) arguing about a situation that refers to a concept they are learning about. They aim to provoke discussion and thinking. They are experienced as non-judgemental by your pupil because they are asked to pretend to be one of the characters and argue from their point of view. Here is an example of a 'Concept Cartoon' for a plant growth lesson, called "Heavy Plants" with the following statements:

- As the plant grows its extra weight comes from the soil.
- Its extra weight comes from the water it takes in through the roots.
- Its extra weight comes from the air.
- I think it gets bigger but not heavier.



Figure 8. A Concept Cartoon about plant growth

Pyramid Discussion

This is where a topic is given in class, for example, 'Pollution'. The teacher asks pupil to discuss the topic first in pairs, then in fours, then in groups of 8, 16 etc until the whole class is involved in the discussion. In this way pupil build positively and uncritically on what others say.

Participatory Feedback

Thinking carefully about how ideas and feedback will be shared is important. Asking groups to report or present their findings will mean that the others are simply listening, or even not listening at all. It can also be very time-consuming. 'Participatory Feedback' helps pupils listen actively and add to what others are saying. For example:

- Ask only two of the groups in your class to present their findings. Do not say in advance which groups will report – this will keep all of the groups engaged. When the two groups present their findings, the other groups then have to add their own ideas, but they are not allowed to repeat what has already been said. This will mean that all the groups have to listen actively and identify what has been said already.
- Ask the groups to report back in the style of a 'Twitter feed'. You decide the limitations: five sentences, one minute, 140 characters ...
- Ask the groups to identify one issue or aspect that they want to focus on in their group feedback. At the same time you request that this feedback is done in an interactive way, involving all the other participants. At the end of the feedback, the extent of just how interactive this was is discussed so that everyone gets ideas about how to make a workshop interactive.

- Groups write their ideas on a poster that is put on the walls. Give time for everyone to walk around, read these posters and add comments and thoughts, either by writing them on the posters or on Post-it notes added to the posters. As the teacher, you can then pick out the ideas that you want to refer to or discuss further.



Please refer back to the gender section in the introduction to T3-1, and bear in mind the number of questions asked/answered by males and females, the amount of attention you give, being patient with students who may be shy or afraid to talk, and, when doing group work, experiment with different student groupings.

T3-2 i 3 Activity: Concept Cartoons



In small groups, first talk to your teacher colleagues about each of the activities suggested. Then try out the 'Concept Cartoon' activity in your group.

Teacher Discussion

Discuss with your colleagues:



- Did you feel happy sharing your ideas as one of the characters?
- Did the activity make you listen to each other and build on what your colleagues were saying?
- In what way did the concept cartoon help to develop discussion?

Make notes of your ideas in your learning journal.

T3-2 i 4 Plan and Practise Together



The next three sections have examples of different activities for Building on What Others Say that can be used in all subjects. In your own planning, please use the introduction above if you need further information on the various aspects. Also note that the example provided in each section is just for guidance. Do not spend too long on it, but move straight on to your planning activity.

T3-2 i 5 Prepare for Teach and Reflect



Once you have planned your activity, come back together as a whole group, to see what issues arose. Make a note in your learning journal. After you have taught, write down your own observations and reflections on your activity plan and in your learning journal, and be prepared to share these with others at the start of the next session.

T3-2 i 6 Sources



TESS-India, *Running an effective participatory interactive workshop*, http://www.open.edu/openlearnworks/pluginfile.php/159529/mod_resource/content/3/TEGN_Workshop.pdf, available under Creative Commons

Attribution-ShareAlike (<http://creativecommons.org/licenses/by-sa/3.0/>;
unless identified otherwise).

Cartoon Concept “Heavy Plans” from: Primary science teaching trust, http://www.pstt.org.uk/ext/cpd/argumentation/unit3-concept_cartoons.php.
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Teaching Strategy 2

Building on What Others Say in English

T3-2 E 1 Example



How Ms Mensah Got Her Pupils Talking in English

In this teaching strategy Building on What Others Say, we are linking two activities: 'Cumulative Talk' and 'Participatory Feedback'. For 'Cumulative Talk' we introduce the 'Pyramid Discussion' and for 'Participatory Feedback' we look at the use of posters. Therefore there are two scenarios and two associated discussion points. Make sure that you divide your time evenly.

First read the following scenario about the teacher, Ms Mensah, and then discuss the questions under Teacher Discussion.

Cumulative Talk: Pyramid Discussion

Ms. Mensah prepares a lesson in a literature class on the prose from the JHS 2 English Language Syllabus, Section 5, Unit 1. Before reading the story, she decides to encourage Talk for Learning using a 'Pyramid Discussion.'

She then asks the class to discuss,, in pairs,, one of the themes of the prose, for example, 'Magic and Superstition'. She asks them to think about the role they play in their society (community).

She asks the pairs to join another pair to share their ideas. After a few minutes, she asks the group of four to join another group of four to have eight members. She encourages them to pool their ideas and build on them. This activity goes on until the whole class forms one big group to share all the ideas formed from the pair to the larger group.

Teacher Discussion on Cumulative Talk



- How did using the 'Pyramid Discussion' help Ms Mensah's pupils build on each others' ideas?
- How could you adapt this strategy for your own subject area?
- How can you make sure that all pupils participate equally, even as the pyramid grows?



Figure 9. Reaching a consensus in a pyramid discussion

Participatory Feedback: Using Posters

Secondly, read about what Ms Mensah does in her next lesson and discuss the questions that follow it. In the next lesson Ms Mensah wants to develop the five themes (e.g. superstition, marriage, hard-work, betrayal, industrialisation) in the prose further. She organises her pupils into five groups and gives each group a theme from the story. She asks them to:

- Brainstorm ideas about their theme.
- Create a poster to present the key concepts in their theme and how they are relevant today. You can use words and pictures/design.
- Stick their posters on the wall.
- Walk around the classroom, read the other posters and add their own ideas if they have any. They can also ask questions to other groups for clarification or more information.

Teacher Discussion on Participatory Feedback



What are the benefits of using posters as a form of giving/getting feedback? Think of the question both in terms of the pupil and the teacher. Make a note of the benefits in your learning journals.

T3-2 E 2 Plan and Practise Together



Building on What Others Say Across the Curriculum

You are now going to plan your own 'Pyramid Discussion' and participatory activity. If the above examples fit what you are teaching, you can use

them. However, you may well be teaching something else, so here are some more ideas from various subjects that lend themselves to 'Pyramid Discussion' and 'Participatory Feedback'.

Interaction of Matter: Infectious Diseases of Humans and PLants (JHS Integrated Science Syllabus: JHS 2, Unit 1)

Remember that that the pupil facilitates the discussion from pair work to whole class on infectious diseases of humans and plants. In your next lesson (or if time in the same lesson) use 'Participatory Feedback' with posters on infectious diseases of humans and plants.

Listening to Poems and Rhymes (Primary 6 English Language Syllabus, Section 1, Unit 1)

Plan and practise 'Cumulative Talk' using 'Pyramid'. After the pupils have listened to the poem or rhyme, use 'Pyramid' to get them to discuss what they think the poem is about. Insist that there is no 'one right answer' and it is their own interpretation that matters. In a follow up lesson, groups could write their own poems which are then then displayed on posters,, and peers give 'Participatory Feedback'.

Measurement of Time and Money (Primary 33 Maths Syllabus, Unit 1010)

As an introduction to this unit, plan and practise a lesson that puts your pupils into three groups to brainstorm and discuss the measurement of time. Then use 'Participatory Feedback', such as posters.

Plan Your Own Activity



Hopefully the above topics give you an idea of how you can use 'Cumulative Talk' and 'Participatory Feedback'. But, as usual, you should identify a topic that fits into your weekly lesson forecast.

Remember that that you first try this, do not make it too complex - your pupils will need time to understand what is happening and become comfortable with the ideas.



At the end of the planning activity you should have developed an activity plan that you can use in your teaching in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.

T3-2 E 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-2 E 4 Reflect Together



Cumulative Talk and Participatory Feedback

Now that you have tried out activities for 'Cumulative Talk' and 'Participatory Feedback', use the 'Pyramid' to discuss the following reflective questions:

- Did you observe any stages when your pupils were using 'Cumulative Talk'?
- Did the pupils achieve what you hoped they would achieve in terms of 'Cumulative Talk'? What was that?
- How did the pupils give/receive feedback? Was it participatory? How was it participatory?
- Did you think male pupils were participating more than female pupils? If so, did you do anything to make things more equal?
- If you taught the lesson again, what would you do the same/differently to encourage cumulative talk and get/receive feedback effectively?

Teaching Strategy 2

Building on What Others Say in Mathematics

T3-2 M 1 Example



How Ms Amina Got her Pupils to Listen and Build on Each Others Ideas

This section gives some examples of how to use activities to support your pupils to build on what their peers say. You can find more ideas that can be adapted to a mathematics learning context in the overall introduction section of Talk for Learning, and in the science and English units.

Ms Amina is a student teacher in the Volta Region. She has been thinking about ways of finding out more precisely what her pupils know about the relevant previous knowledge (RPK) for a mathematical topic before she starts teaching it. She feels she sometimes ends up spending time teaching her pupils what they already know, and at the same time, she can still be surprised by what they do not know. She also would like her pupils to learn more from each other and engage with each other's thinking. If they could learn more from each other, that would mean she could free up some more of her teaching time to try out new teaching strategies while still feeling confident that she is 'covering' all the topics she has to teach. To address these issues she decides to use the strategies of 'Brainstorming' and 'Brainwriting' and brainstorming. 'Brainstorming' is to quickly share as many ideas or opinions as possible by saying them out loud and having someone write them all down. 'Brainwriting' is where you ask each individual to write down their ideas first; these are then discussed and categorised in small groups and only after that shared with the whole group.

These are Ms Amina's reflections:

I had looked up 'brainstorming' on the internet and read that to start off the brainstorming activity, you use a brainstorm prompt which can be in the form of a question, a word, a statement, a photograph or a picture. I decided to go with the prompt 'What is involved in solving equations?'

To help my pupils to get used to brainstorm in a constructive way, without interruption and to get a wide variety of ideas, I wrote some expectations on a poster beforehand and stuck it on the wall which we then discussed before we started. It read:

Brainstorming and brainwriting rules:

1. Criticism is not allowed: all ideas relevant to the topic are welcome.
2. Being unconventional is welcomed: The wilder the idea, the better. Inappropriate ideas can be rejected later.
3. Quantity is good: The greater the number of ideas, the better the process works. So everyone should try to participate. At the same time do not repeat what has been said already.
4. Combination and improvement are sought: In addition to contributing ideas of your own, you can also suggest how the ideas of others can be turned into better ideas, or how two or more ideas can be joined into yet another idea.

I then discussed some of the issues of brainstorming: how some people in the group might dominate and how early ideas can direct and limit what is offered later – potentially losing original ideas. To address this I told them I first wanted them to brainwrite in pairs.

What is involved in solving equations?

equal sign - balancing - what you do to one side, you do to the other as well

variable - number in front of the variable (coefficient) - different operations

Figure 10. Student teacher 1

What is involved in solving equations?

what to get rid off first -> order of operations -> doing those in reverse order

finding solutions in the form of $x=...$ or $...=x$

dealing with brackets -> expanding brackets -> factorising

Figure 11. Student teacher 2

When we moved on to doing the brainstorming with the whole class, I recorded all their ideas on the board, whether I thought them to be good or not. These are some of the ideas that were mentioned: factorisation, multiplying out brackets, variable, unknown, constant, linear, quadratic, order of operations, indices. To focus more on building what their peers said I asked them at times when something generic was said, for example 'factorisation' to brainstorm 'factorisation' for a little while. To finalise the brainstorming activity I asked the students in groups to pick out three of the ideas that they would like to get to understand better.

What is involved in solving equations?

equal sign - balancing - what you do to one side, you do to the other as well

variable - x , y , s , t , etc \rightarrow number in front of the variable (coefficient) - different operations

order in solving equations \rightarrow order of operations \rightarrow doing those in reverse order \rightarrow 'weakest' operation goes first \rightarrow inverse operations

write solutions as $x=...$ or $...=x$ \rightarrow variable = ... or ... = variable

dealing with brackets \rightarrow expanding brackets \rightarrow factorising \rightarrow find common factor \rightarrow put in brackets \rightarrow algebraic identities

Figure 12. Ideas written on the board



Figure 13. A group of student teachers working on a brainstorm

Teacher Discussion



What do you think Ms Amina liked about doing this activity? How do you think it could help your teaching, and your students' learning?

T3-2 M 2 Plan and Practise Together



Brainwriting and Brainstorming

Given the topics that you are teaching this week, the topic in the above example is not likely to work for you. Here are five more ideas that lend themselves to 'Brainstorming' and 'Brainwriting':

Plane Shapes (Primary Mathematics Syllabus 2012, Unit 3.9)

'Brainstorming' prompt: 'How can squares and rectangles be identified?'

Reference: Primary Mathematics Syllabus 2012, Unit 3.9, p. 55-56

Set of Numbers (Primary Mathematics Syllabus 2012)

'Brainstorming' prompt: 'What is involved when forming subsets?'

Reference: Primary Mathematics Syllabus 2012, Unit 5.2, p. 82-84.

Percentages (JHS Mathematics Syllabus 2012)

'Brainstorming' prompt: 'What do we know about calculating profit as a percentage?'

Reference: JHS Mathematics Syllabus 2012, Unit 1.13, p. 28-29.

Science: (Primary Integrated Science Syllabus)

'Brainstorming' prompt: 'What do we know about air?'

Reference: National Syllabus for Integrated Science (Primary 4-6), Primary 6, Section 1: Diversity of Matter, Unit 2, "Air".

Plan Your Own Activity



Can you use any of the above ideas? If not, consult your syllabus and choose a topic from a lesson you will teach next week where you can use 'Brainstorming' and 'Brainwriting'. Make detailed plans. At the end of the planning activity you should have developed an activity plan that you can teach in the coming week. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.



At the end of the planning activity you should have developed an activity plan that you can use in your teaching in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.

T3-2 M 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember

to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-2 M 4 Reflect Together



Brainwriting and Brainstorming

Here are some prompts for reflection.

- What did you learning by using the 'Brainwriting and Brainstorming' activity? Did you learn something new about the thinking and knowledge of your pupils?
- Did you find that male pupils were participating more than female pupils? If so, did you do anything to make things more equal?
- Did the activity help your pupils to learn from talking? If yes, how?
- Is there anything you could do further to improve this?
- Did you find that male students were participating more than female pupils? If so, did you do anything to make things more equal?

T3-2 M 5 Sources



TESS-India, *Brainstorming: forces and laws of motion*, http://www.open.edu/openlearnworks/pluginfile.php/145522/mod_resource/content/2/SS11_Using%20brainstorming%20to%20teach%20forces%20and%20laws%20of%20motion.pdf, available under Creative Commons Attribution-ShareAlike (<http://creativecommons.org/licenses/by-sa/3.0/>; unless identified otherwise).

TESS-India, *Running an effective participatory interactive workshop*, http://www.open.edu/openlearnworks/pluginfile.php/159529/mod_resource/content/3/TEGN_Workshop.pdf, available under Creative Commons Attribution-ShareAlike (<http://creativecommons.org/licenses/by-sa/3.0/>; unless identified otherwise).



Figure 14. A group of student teachers working on a 'Brainstorm'

Teaching Strategy 2

Building on What Others Say in Science

T3-2 S 1 Example



Using Concept Cartoons to Build on What Others Say in Science

You all have favourite cartoons and comics that you enjoy reading. You might be surprised to know that you can use cartoons in science as a tool to improve your pupils' engagement in lessons. If the cartoons are well designed, you can also use them to probe your pupils' subject knowledge and conceptual understanding. These well designed cartoons are referred to as 'Concept Cartoons' and they have been used in classrooms all around the world since the late 1990s. They have been around long enough for research into their impact to have been done and they really do work (see reference at the end of this section).

Teacher Serwaa plans to do a 'Concept Cartoon' activity with her pupils. Her reasons for using the 'Concept Cartoon' activity are twofold:

- She wants them to get some more experience of Talk for Learning, specifically Building on Talk, and the 'Concept Cartoon' is a good choice for this. Group members are encouraged to build on the idea written in their speech bubble whilst trying to convince the other group members of its validity.
- Also, as what they are talking about is not necessarily their own viewpoint, this makes it easier for the pupils to speak freely without being afraid of making mistakes.

Serwaa hopes that she can probe her pupils subject knowledge too during the activity. As they will be studying heat energy next lesson, and knowing that pupils sometimes forget to think about heat being transferred from the room rather than a heat source, she uses the scenario of ice cubes melting in a room. She makes her cartoon more challenging by choosing different materials on which to place the ice but she is careful to keep the shape, colour and size of the materials the same so as not to complicate matters.

Teacher Serwaa's Concept Cartoon Activity With Pupils

When planning for the 'Concept Cartoon' activity, Serwaa makes these notes in her activity plan:

- Pupils work in small groups so that everyone gets the opportunity to speak.

- Remember to show the whole class the 'Concept Cartoon' before the class breaks up into groups.
- Ask the pupils to think on their own first about the information in the speech bubbles and whether or not they agree with it.
- Group work: pupils talk about all of the viewpoints and try to reach agreement about which is the most accurate one and why.
- Remind pupils that they can choose to agree with any viewpoint but they must also consider the other viewpoints that are expressed and say why they disagree with them.

Her cartoon shows a white plastic plate and a same-sized white metal plate with some same-sized ice cubes on them (one on each plate) along with several pupils with speech bubbles (similar to the image below) containing the following statements:

- I think that the ice cubes will melt at the same rate.
- Because the metal feels cold, I think that the ice cube on it will not melt very quickly.
- Because the plastic feels warmer than the metal I think the ice cube on it will melt faster.
- The plastic will insulate the ice cube so it will not melt.
- I think that the ice cube on the metal will melt faster.

DBE syllabus reference: "Heat Energy" (FDC224, *Integrated Science 3*, Physics, Unit 2).

Teacher Serwaa describes how she does the activity as follows:

I remind the pupils that *all* of the ideas have equal status and that they are *all* legitimate and plausible points of view. They should each take on a viewpoint and build on it during the group discussion using their own scientific knowledge and understanding. I tell them that it is a good idea if each person in the group takes on a different viewpoint (even one that they may not be completely aligned with) and I explain to them that as the focus of the activity is *building on what others say in science*, by ensuring that all of the viewpoints are expressed, they will stimulate a discussion that allows all of the group members to explore their thinking and to challenge their own and each other's ideas. This is preferable, I tell them, to the situation where they are just confirming what they think.

I am so pleased to see that the pupils in some groups are co-constructing arguments during their discussions and I am very impressed with the level of engagement in the activity by all of the pupils - it is quite surprising how quickly the discussions get going. I am glad that many of the groups are concluding that the ice cube on the metal plate will melt faster because the metal conducts the heat from the room to the ice - phew!

At the end of the activity Serwaa asks all the pupils to write in their books, three things they enjoyed about the activity, two things they would do differently in their group next time and one thing that they changed their thinking about.

Teacher Discussion



Here are some questions to discuss in your groups after you have read through the 'Concept Cartoon' example:

- What do you think of the choice of cartoon?
- What affect do you think using something familiar (ice cubes) will have on the talk outcomes?
- What are some of the challenges that you anticipate when doing this activity?
- How will you ensure that all pupils, especially females, participate equally?
- How will you ensure that as well as Building on Talk, pupils get the scientific concepts right?
- What resources will you use to prepare yourself for the types of questions that might arise during the activity?
- Would you like to use one large cartoon on the board or you would like to provide handouts of the cartoons for the various groups? Why?
- What feedback will you take from the various groups after they have completed the activity?

You can use the 'Concept Cartoon' technique in groups or as a whole class dialogue activity. Think about the following:

- What will Serwaa be doing during the group work version of the activity (the example)?
- How will Serwaa's role be different when she does a whole class dialogue version of a 'Concept Cartoon' activity?

T3-2 S 2 Plan and Practise Together



Concept Cartoons

You are now going to plan your own 'Concept Cartoon' activity. Here are some ways that you can adapt the activity in the example for the year group/s that you will teach.

JHS

The previous example will work for you if you happen to be teaching about heat energy in JHS.

Reference: National Syllabus for Integrated Science (Junior High School), JHS 3, Section 4: Energy, Unit 1, "Heat Energy".

Alternatively you can use a 'Concept Cartoon' on force (gravitational). Have an image of an astronaut standing on the moon with a hammer in one hand and a feather in the other with the caption "The astronaut drops the hammer and the feather at the same - what happens?"



Figure 15. The astronaut drops the hammer and the feather at the same - what happens?

Use the following statements with the image:

- I think the hammer will hit the ground first.
- I think they will both float.
- They will hit the ground at the same time.

Reference: National Syllabus for Integrated Science (Junior High School), JHS 2, Section 5: Interactions of Matter, Unit 3, "Force and Pressure".

Upper Primary

A similar 'Concept Cartoon' to the example can be used if you are teaching heat to primary 6. Consider giving the characters names for ease of discussion with younger children.

Reference: National Syllabus for Integrated Science (Primary 4-6), Primary 5, Section 4: Energy, Unit 4, "Heat".

Lower Primary

The snowman's coat is a great heat energy 'Concept Cartoon' that you can use for young children.

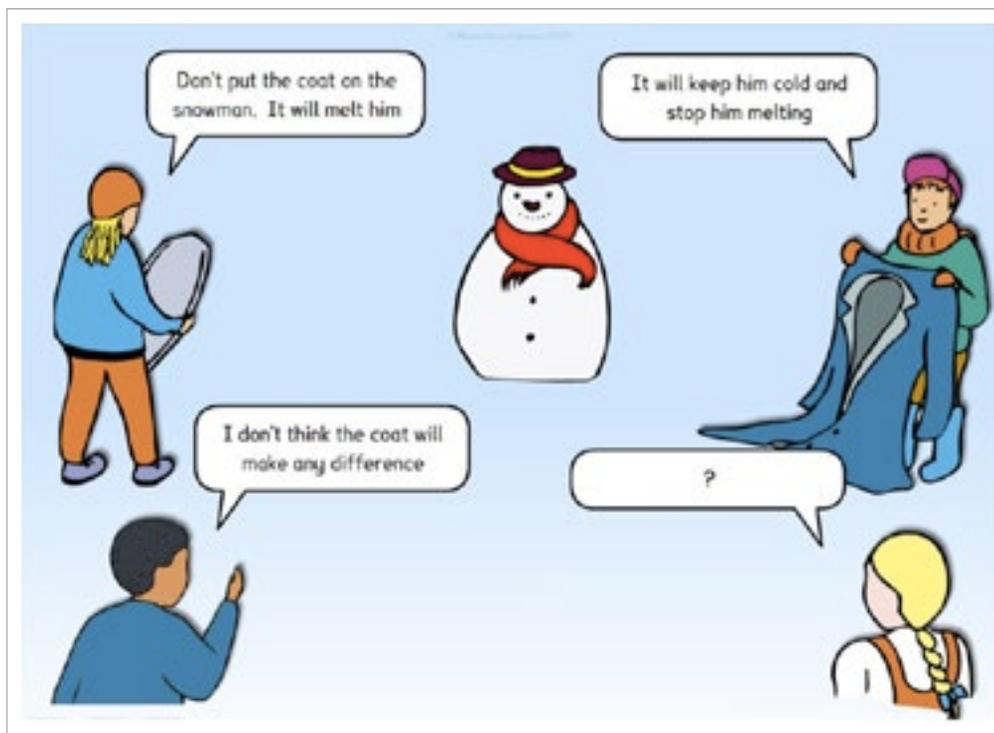


Figure 16. The snowman's coat 'Concept Cartoon'

Make sure to draw out the point that the coat is not an energy source so cannot make the snowman hot.

A plausible alternative that pupils may come up with is that the coat will stop the sun from melting the snowman (by keeping it 'out').

Reference: National Syllabus for Natural Science (Primary 1-3), Primary 2, Section 4: Energy, Unit 1, "Hot and Cold".

English

Use the prompt "What makes a good book?"

Here are some responses to use:

- I think good characters are most important.
- A good book needs to have great plot.
- Excellent descriptions make a book good.
- The setting is the most important thing.

Reference: Primary Mathematics Syllabus 2012, Primary 6, Section: Library, Specific Objective 2 vii, "Pupils will talk about what they see in books."

Maths

'Concept Cartoon' statement: $0.13 \times 100 = ?$

Bubble statements:

- "I think the answer is 1013."
- "You just add 2 zeros, so you get 0.1300."
- "The number gets 100 times bigger so you need to move the number two spaces to the left of the decimal point. You get 13."

Reference: Primary Mathematics Syllabus 2012, Unit 6.5, "Decimal Fractions and Percentages".

Planning Your Own Concept Cartoon Activity



Choose a topic from a lesson you will teach next week that has a concept that you can make a cartoon about. It should be something that pupils can have different ideas about. Come up with these ideas and make sure they are typical of what a pupil might actually think about the concept (at least 3 ideas so that their will be enough to talk about). You can include a blank speech bubble in your cartoon to encourage pupils to explore alternative ideas.

Sketch a simple scene (that the pupils are looking at and commenting on) in your activity plan; you can find the activity plan template in the appendix. Pupils can be hand-drawn or represented using simple clipart characters like this:

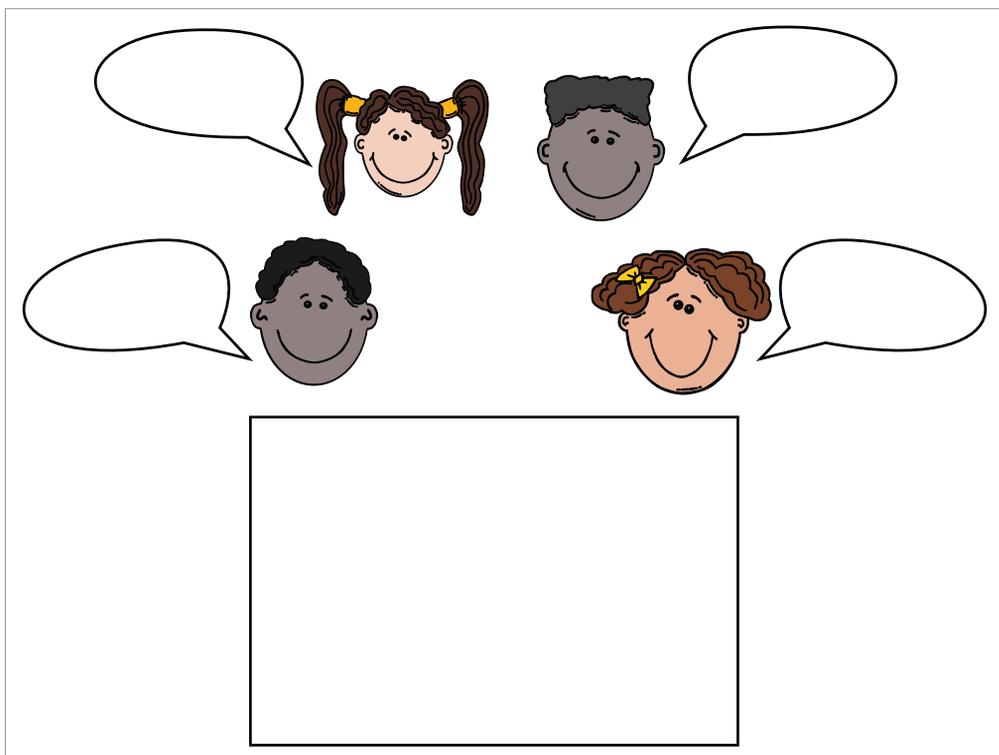


Figure 17. A basic 'Concept Cartoon' template

Also write in your plan other planning details (resources needed etc.) that will help you to do the activity successfully with your pupils.



At the end of the planning activity you should have developed an activity plan that you can teach in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.

T3-2 S 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

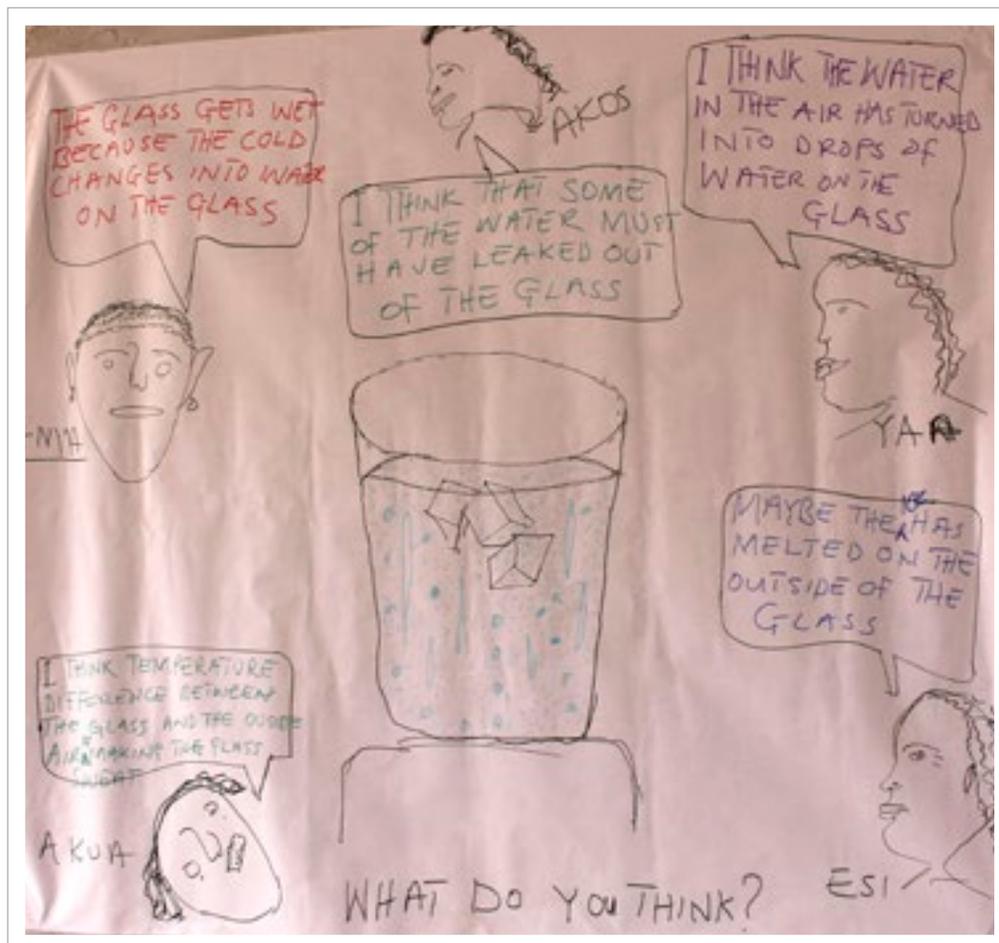


Figure 18. Hand drawn Concept Cartoon displayed on the board

T3-2 S 4 Reflect Together



Concept Cartoons

Now that you have done the 'Concept Cartoon' activity with your pupils, reflect on how it went. Do the reflection together with colleagues who also tried the activity.

In your reflection, consider the following questions:

- How useful was your cartoon for getting pupils to build on what each other said?
- Did pupils engage with the concept at the right level?
- Did anyone use a blank speech bubble in their cartoon? How did that go?
- Did anything surprise you during the activity? If yes, what?
- What will you do differently next time you do a 'Concept Cartoon' activity? Why?

Remember to write down your thoughts in your learning journal. Also note down what you learned from this session that was most effective in improving your teaching.

T3-2 S 5 Further Resources



The following links provide further information:

- Research - Concept Cartoons, <http://conceptcartoons.com/research.html>
- Useful list of common misconceptions in science: <http://amasci.com/miscon/opphys.html>.
- Useful overview of Concept Cartoons: <http://www.conceptcartoons.com/>.
- The snowman's coat story is used in the following video: <https://www.stem.org.uk/elibrary/resource/30667/materials?logo=4>

T3-2 S 6 Sources



Image: "A basic concept cartoon template" - The pupils' clip art faces came from this open source (by Gerald_G): <https://openclipart.org/detail/857/boy-face-cartoon>

Image: "The snowman's coat concept cartoon" adapted from the snowman's coat concept cartoon (created by Brenda Keogh and Stuart Naylor) provided here: <https://www.stem.org.uk/elibrary/resource/25952/concept-cartoons-change-of-state-and-insulation?logo=2> with the following licence: Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International Public License

Image: "The astronaut drops the hammer and the feather at the same - what happens?" adapted from this astronaut image in the public domain (not protected by copyright) here: https://commons.wikimedia.org/wiki/File:Apollo_17_Cernan_on_moon.jpg



Introduction to Teaching Strategy 3

Managing Talk for Learning

T3-3 i 1 Learning Objectives



By the end of the session teachers will be able to:

- use strategies that help all pupils to participate and increase the amount of classroom talk;
- use strategies that help you to regulate talk;
- organise your classroom to encourage talking;
- recognise students being on-task and off-task;
- distinguish between 'good noise' and 'bad noise'; and
- handle low-level disruption.

T3-3 i 2 Introduction



As we saw in the introduction to this theme, not just any talk that happens in your classroom is effective talk, i.e. talk that supports student learning. To make talk effective, you need to first plan activities to initiate Talk for Learning (T3-1). Once you have encouraged your pupils to talk, you then support them in building on what is being said (T3-2). However, you will soon find that this requires management: as a teacher, you need to be able to steer the classroom talk, so that it remains effective (and focused on the learning objectives). In this teaching strategy, we are introducing a few tools that can help you do that.

The table below suggests a number of ways of helping you manage Talk for Learning with your pupils so that they can share their ideas, listen, challenge each other constructively and ensure that everybody is participating. They fall mainly into four categories and are activities that relate to:

- Establishing ways of working together, e.g. 'Ground Rules for Talk'
- Classroom organisation, e.g. 'Seating Arrangements'
- Patterns of talk, e.g. 'Think-Pair-Share, Changing Partners'
- Regulating participation in talk, e.g. 'Talking Tokens', 'Activity Ball' or 'Magic Microphone'.

Theme 3: Talk for Learning Teaching Strategy 3: Managing Talk for Learning		
Aspect	How it works	Section
Activity Ball or Magic Microphone	An item (such as a ball) is passed around, and only the person who has the ball can speak.	T3-3i
Changing Partners	Prepare sets of cards with matching pairs or with groups/families of words. Ask the pupils to find their partner/group and sit with them.	T3-3i
Ground Rules for Talk	Pupils work together to establish a set of rules that allow them to express themselves freely during talk activities.	T3-3i
Seating Arrangements	Choose the seating arrangement that will help to facilitate the interactive nature of an activity and support Talk for Learning.	T3-3E
Talking Tokens	Each pupil receives a number of tokens, and gives one up each time they speak.	T3-3S
Think-Pair-Share	Pupils think on their own first, then talk to another student, before sharing with the class.	T3-3M

You might also want to look back at the ideas in Initiating Talk for Learning, that can be used to increase the amount of talk (such as the use of talking points). Sometimes you may need to direct talk, to make sure everybody's voice is heard, and you can refer back to the Theme 2: Questioning for this. For instance "no hands up" can be used to simply ask students to speak.

Regulating Participation in Talk: Talking Tokens and Activity Ball or Magic Microphone

As your pupils engage more and more in Talk for Learning in the classroom it will become necessary for them to regulate their participation to ensure that their talk remains effective. There are many techniques that you can use to structure talk, including

- **Talking Tokens:** Each student receives a number of tokens, and gives one up each time they speak.
- **Activity Ball or Magic Microphone.** An item (such as a ball) is passed around, and only the person who has the ball can speak.

By structuring talk in this way the hope is that pupils will make more meaningful contributions to discussions by having to think first before they speak and having to listen well so as not to repeat points made by others.

Patterns of Talk: Think-Pair-Share and Changing Partners.

Talk can take place in different ways, such as between two pupils, in smaller or larger groups, as well as whole class dialogue (involving all pupils). It is also possible to mix these:

- **Think-Pair-Share.** You can vary the way students talk to each other through techniques like 'Think-Pair-Share', where pupils think on their own first, then talk to another student, before sharing with the class.
- **Changing Partners.** This is a way of getting pupils who have never sat next to each other to sit together. Prepare sets of cards either with matching pairs or with groups/families of words and hand these out. Ask the pupils to find their partner/group and sit with them.

Having set patterns like this adds structure to the way pupils talk to each other, and can be helpful in managing talk. Be aware that it will take time for pupils to get used to these new ideas. You will find that once you have tried them a few times, they will go more smoothly.

Classroom Organisation: Seating Arrangements

You also need to think about your classroom organisation: what to do from an organisational point of view to create an open and supportive classroom environment; what physical changes can be made to the classroom environment that will help your pupils to communicate with each other. When you require your pupils to talk and listen to each other, they have to be seated in such a way that this is physically possible. Sitting in rows works fine for individual work, or for working in pairs, but conversations involving more people become difficult.

Of course, in environments where student talk in the classroom does not always happen, the desk arrangements may be inflexible. Asking your pupils in the odd row numbers to turn around and then work in fours is often an easy solution, especially if the classroom furniture is fixed. Equally, when you decide to put some tables together so groups can work around these 'group tables', you still have to think about acoustics of the room and whether you are able to move around the classroom so you can listen to and support the groups.

Tips for Work Arrangements and Seating Arrangements

Changing seating or work arrangements can help your pupils in the following ways:

- pupils will interact with other pupils;
- it moves the focus away from the teacher to the pupils;
- pupils will experience different situations to be recreated in the classroom;

- there is variety in the lesson/classroom;
- it changes the environment of the classroom; and
- pupils move and have a chance to stretch their legs!

Other tips:

- remain aware of how you can use the space you are working in;
- sometimes a complete change in the room can make all the difference to the atmosphere of a class;
- mixing female and male students, as well as vocal and shy students, creates new dynamics. Just make sure that these dynamics enhance participation and that no one student dominates; and
- even with the most immovable of furniture it is possible to be creative in some way.

Establishing Ways of Working Together: Ground Rules for Talk

A classroom community of pupils, explicitly establishing ways of working together, is very helpful, and can be done in a participatory way. For example, the pupils in the class can discuss the way their own group is working:

- Are both females and males in the group participating equally?
- Are there some people who dominate the discussions?
- Is the learning that takes place good? Can it be improved?
- What can be done to make the groups operate better?

The discussion: Writing the agreed ways of working on a big sheet and sticking it on the wall works well as it can be referred to, revisited and adjusted on a regular basis, and this helps to manage talk. Sometimes this process is referred to as establishing 'ground rules'.

Please refer back to the gender section in the introduction to T3-1, and bear in mind the number of questions asked/answered by males and females, the amount of attention you give, being patient with students who may be shy or afraid to talk, and, when doing group work, experiment with different student groupings.



T3-4 i 3 Activity: Think-Pair-Share



Here is a statement for you to consider:

Open mining is beneficial for Ghana.

Now do the following:

1. **Think.** First think about your views and ideas about this on your own.
2. **Pair.** Share your ideas with another colleague.

3. **Share.** Share your collective ideas with the rest of your colleagues.

Teacher Discussion

Afterwards discuss with your colleagues:

- Did everyone in the group participate?
- Is the learning that takes place good? Can it be improved?
- What can be done to make the groups/pairs operate better?
- What can be done to ensure that females and males participate equally?

Make notes of your ideas in your learning journal.

T3-3 i 4 Plan and Practise Together



The next three sections have examples of different activities for managing Talk for Learning that can be used in all subjects. In your own planning, please use the introduction above if you need further information on the various aspects. Also note that the example provided in each section is just for guidance. Do not spend too long on it, but move straight on to your planning activity.

T3-3 i 5 Prepare for Teach and Reflect



Once you have planned your activity, come back together as a whole group, to see what issues arose. Make a note in your learning journal. After you have taught, write down your own observations and reflections on your activity plan and in your learning journal, and be prepared to share these with others at the start of the next session.



Teaching Strategy 3

Managing Talk for Learning in English

T3-3 E 1 Example



How Ms Amina Managed Talk for Learning in Her Class

Classroom Seating Arrangements

Ms Amina decides to create a drama based on a piece of prose the class has been reading for her Primary 4 drama class. She wants to encourage Talk for Learning in her class but she seems to be confused about how to arrange and manage her class for interactive teaching and learning.

Look at the pictures of different seating arrangements below and help Ms. Amina to decide on the appropriate classroom arrangement and management, bearing in mind she wants to encourage as many of her pupils to be involved and talk in a meaningful way about the prose and to do this through drama (acting out a part of the prose).

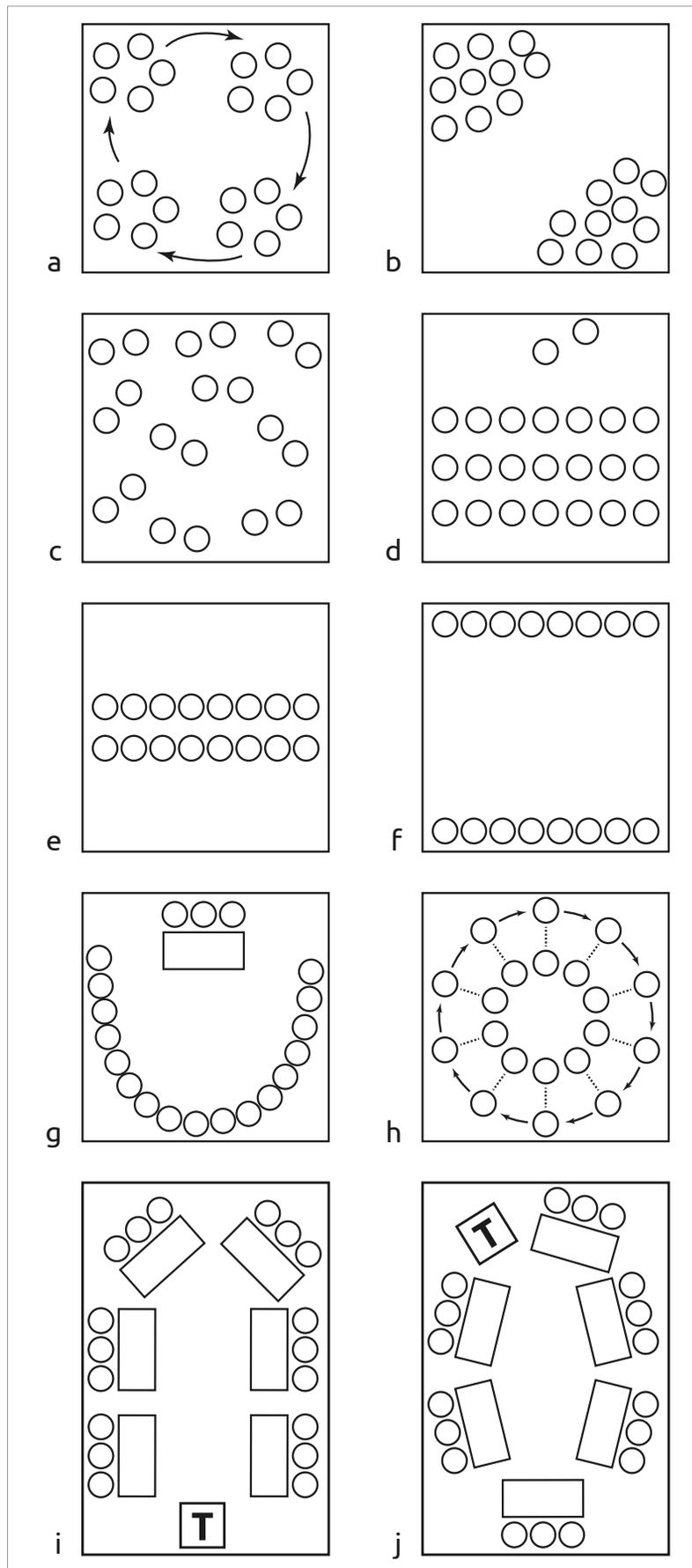


Figure 19. Seating arrangements for interactive teaching and learning

Teacher Discussion



1. In trying to manage Talk for Learning in her class, what class arrangements would you consider appropriate for Ms Amina to use?
2. Why do you think such arrangements are appropriate and necessary?
3. How would such arrangements support Talk for Learning in Ms Amina's class?
4. Would you encourage such arrangements in your class? Why?

More questions specific to English:

- Why might a 'Circle' or a 'Horseshoe' work arrangement be more effective for language teaching than straight rows?
- What difference does it make if the sits in a circle with the pupils rather than standing in front of them?

T3-3 E 2 Plan and Practise Together



Seating Arrangements

You are now going to plan your own Talk for Learning activity by thinking about the management of the activity and specifically the seating arrangements. If the above examples fit what you are teaching, you can use them. However, you may well be teaching something else, so here are some more ideas from various subjects that lend themselves to Talk for Learning activities with different seating arrangements.

Living Things and Non-living Things (Primary 1-3 Natural Science Syllabus, Unit 1)

Plan a lesson on how you would arrange your class to talk more about living things and non-living things. Think about how you would manage and arrange your class to encourage and maximise Talk for Learning. Use the guidelines in the syllabus but think carefully how you would manage this before, during and after the activity.

Division (Primary 1 Maths Syllabus, Unit 2.13)

As you plan your lesson on 'Division', think about the reasons why you picked your class arrangement and how it will help in managing Talk for Learning in your class on the topic 'Division'.

Writing Short Descriptions (Primary 3 English Syllabus, Section 4, Unit 2)

While planning a lesson on writing short descriptions in English Language consider the advantages and disadvantages of the types of classroom arrangement and pick the most appropriate one to manage Talk for Learning

in your class. How can you use Talk for Learning in a writing class and how can the seating arrangements encourage and support this talk?



Figure 20. Organising furniture for group work

Plan Your own Activity



Can you use any of the above ideas? Hopefully the above topics give you an idea of how you can use design an activity for use in your classroom. But, as usual, it is possible that those ideas do not fit, and you will need to identify a topic that fits into your weekly lesson forecast.



At the end of the planning activity you should have developed an activity plan that you can use in your teaching in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.

T3-3 E 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-3 E 4 Reflect Together



Seating Arrangements

Use the seating arrangements above as part of the reflective practice on 'Managing Group Work.' Some of the questions you might ask are:

- Are you familiar with these work arrangements to help you manage your class? If so what do you call them? Have you used them? When and how?
- What type of activities might suit each? Can you come up with a teaching and learning scenario (that focuses on Talk for Learning) for each of the seating arrangements?

Do a quick 'Matching' activity as a review to the session. Here is a list of names to match to the seating arrangements:

- Onion
- Horseshoe with tutor as participant
- Public Meeting
- Panel
- Pairs (face-to-face or back-to-back)
- Horseshoe with tutor as leader
- 'Buzz' groups
- 'Corners'
- 'Team Competitions'
- Pairs



Teaching Strategy 3

Managing Talk for Learning in Mathematics

T3-3 M 1 Example



Ms Gertrude Tackles Gender Issues

This is Ms Gertrude's story about how she managed Talk for Learning in her maths classroom and addressed some gender issues at the same time.

This was the second month I was teaching this class in which about three quarters of the class is male, and a quarter is female. I became disconcerted about some gender issues that were occurring. For example, I had noticed that the girls will talk, but only when asked. At the same time the pupils volunteering to answer and raising their hands tend to be boys, and most boys will also cut in with their ideas when others, boy or girl, are talking.

The desks in the classroom are arranged in rows, rearranging this to make it more suitable for group work is not easy and is time consuming. Moving the furniture only for the maths lesson is difficult.

To make the girls more confident to share their ideas and give them more practice in talking mathematically before discussing their ideas with their male peers, I decided to use the approach of 'Think-Pair-Share', where the 'Pair' section is done in same gender pairs. I then asked them to address the same questions in groups of four. To make discussion physically possible, I asked the pupils sitting on every other row to turn around to work with those behind them and moved some pupils so that none of the groups would be all female.

Before letting them start the group discussions, we looked at the list we had devised together some weeks back on ways of working together that they had all copied in their notebook. The maths activity was about 'Proportion - Inverse and Direct' (JHS Mathematics Syllabus, unit 6.7). In this lesson I wanted them to see how proportional properties are applied (or not) in maths and in real life. Before the start of the lesson I had written the statements (see further down) they had to consider on the board, ready for the lesson.

I told the pupils: *The statements written on the board describe some real life and maths situations. Read these and decide whether these would be proportional or not, and under what conditions. Provide your reasons. First think about these yourself, then discuss these with your neighbour. I will ask you later to then talk to another pair to see whether you have the same opinions. Be critical!*

I noticed that all pupils talked happily to their neighbour in the 'Think-Pair-Share' activity and once working in groups of four, the female pupils seemed to keep that confidence. Managing the talk for learning groupwork seemed to work like this. Next time I will try the same approach, but with mixed gender 'Think-Pair-Share' (at least for as much as possible). I am curious to see whether it is the working in same gender pairs that gives the confidence, or whether it is just the 'Think-Pair-Share' activity.

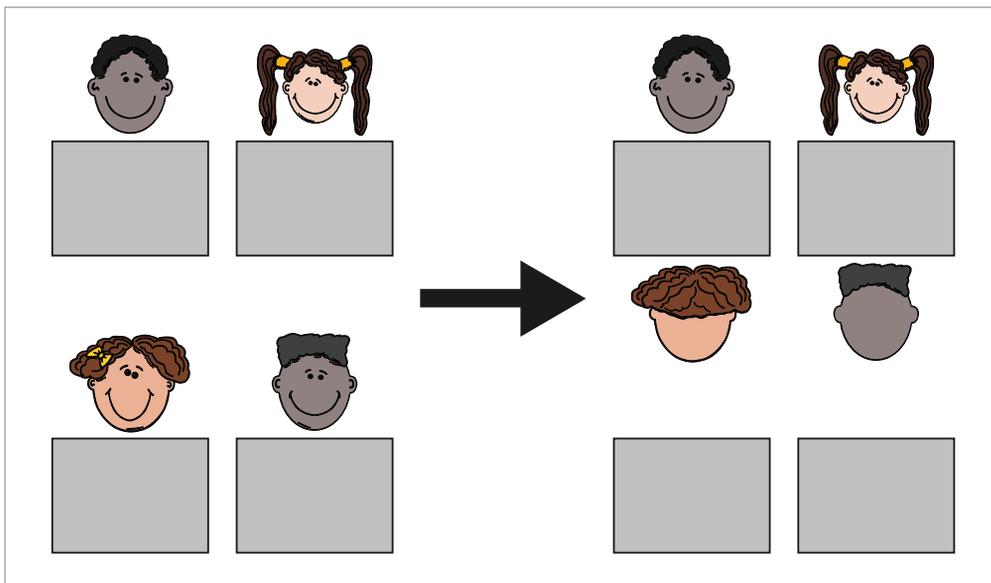


Figure 21. Changing desks arrangements for group work

Do the following have any proportional properties?

- Enlarging a photograph.
- Cutting slices of bread to make a sandwich.
- The work done by some number of people in a given time frame.
- The amount of money spent by a number of people to watch a particular movie at a particular cinema.
- The height of The Flagstaff House (see Figure).
- The circumference of a circle.
- The volume of a cylinder.
- A tro-tro fare.

The list written by Ms Gertrude on the whiteboard.



Figure 22. The Flagstaff house, Accra

Teacher Discussion



Do the same 'Think-Pair-Share' activity for any three statements of the maths activity above. Then share your ideas with another pair. Limit your time to 5 minutes in total, just so you have some idea of what ideas your pupils could come up with.

Discuss afterwards:

- Did this approach make you talk for learning about proportion?
- How did doing the 'Think-Pair-Share' before talking in a group of four support you in your learning?
- Would you change anything if you were doing this in your classroom?

T3-3 M 2 Plan and Practise Together



Think-Pair-Share

'Think-Pair-Share' can be used for almost anything. It works particularly well for topics that benefit from pupils coming up with their individual ideas before sharing, refining those and getting more ideas from talking to others. Given the topics that you are teaching this week, the topic in the above example is not likely to work for you. Here are three more ideas that lend themselves to using this 'Think-Pair-Share' strategy:

Investigations With Numbers (Maths)

Find examples of real life situations that can be expressed as patterns. For example the weaving pattern of Kente cloth, bumps on pineapples, different ways you can go up and down stairs.

Reference: Primary Mathematics Syllabus 2012, Unit 4.13, p. 80

Properties of Polygons (Maths)

Look at pictures of buildings and identify where Pythagoras' theorem could be applied. For example the length of the sloping surface of a roof, working out the height of a building, working out the quantity of materials to be used on a roof.

Reference: JHS Mathematics Syllabus 2012, Unit 3.7, p. 63-64

Ten and Ones (Maths)

Tell the pupils to imagine they are walking from home to school. Can they come up with three examples for:

- the objects or things they would see more than 10 of? (for example birds)
- the objects or things they would see only 1 of? (for example the sun)
- the objects or things they would see between 5 and 10 of? (for example shops that sell sweets)
- the objects or things they would see more than 20 of? (for examples school bags being carried to school by pupils)
- the objects or things they would see more than 100 of? (for example leaves on a tree)

Reference: Primary Mathematics Syllabus 2012, Unit 1.7, p. 11

Plan Your Own Think-Pair-Share Activity



Here are your planning tasks:

1. In groups think of a lesson and a topic that you will teach in the coming week.
2. Identify any gender issues that you might have in your class.
3. Come up with activities suitable for 'Think-Pair-Share' that can address those gender issues. Remember the aim is to stimulate Talk for Learning with all your pupils.
4. Do you feel that 'Think-Pair-Share' will ensure that all pupils, especially females, will participate? Is there anything else you can do to ensure the equal and full participation of your pupils?

You can use the activity plan template found in the appendix. Plan the activities in detail. Please make sure that you have noted down everything you need to remember for your lesson in your activity plan.



At the end of the planning activity you should have developed an activity plan that you can use in your teaching in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.

T3-3 M 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-3 M Reflect Together



Think-Pair-Share

Thinking of the different strategies for managing Talk for Learning you have used so far, have you noticed a difference in:

- the participation in the activities of all pupils, for example male, female, less confident, boisterous pupils?
- the gender issues that you identified in the planning stage?
- the quality of the talk and technical language used on the topic you were teaching?
- the learning of the pupils?

T3-3 M 5 Sources



Image of The Flagstaff house, Accra; https://commons.wikimedia.org/wiki/File:The_Flagstaff_House.jpg, <http://flickr.com/photos/27998473@N02/9762167496>. By jbdodane [CC BY 2.0, <http://creativecommons.org/licenses/by/2.0/>], via Wikimedia Commons.

TESS-India, *Developing mathematical reasoning: mathematical proof*, http://www.open.edu/openlearnworks/pluginfile.php/134971/mod_resource/content/3/SM02_V2_PDF.pdf, available under Creative Commons Attribution-ShareAlike (<http://creativecommons.org/licenses/by-sa/3.0/>; unless identified otherwise).



Teaching Strategy 3

Managing Talk for Learning in Science

T3-3 S 1 Example



Teacher Opoku's Talking Token Activity With Pupils

Teacher Opoku is having problems with managing some of his pupils who like to dominate group discussions in his classroom. A colleague (that he is complaining to) tells him about a classroom management technique called 'Talking Tokens'. 'Talking Tokens' can be small bits of paper (or other small objects) that are given to each pupil in a group so that they can monitor their contribution to the group discussion.

Next week, Opoku will teach his ecosystem topic and he wants the class to work in groups and discuss different threats to the environment. He decides to try out the 'Talking Tokens' strategy and see if he can get everybody in his class to equally contribute to the discussions. He will also use the 'Talking Tokens' strategy in an attempt to improve the quality of his pupils' talk. He hopes that by asking the pupils to make only a few comments, they will make more of an effort to make comments that are worthwhile to the group discussion.

Before the Activity

Opoku makes these notes in his activity plan about how the technique works:

- Each person in the group receives the same number of tokens (usually 3 or 4).
- One token is placed in the middle of the table by the speaker each time they make a contribution to the discussion.
- Pupils take it in turn to speak until they have exhausted their supply of tokens.

He will give some groups the task to talk about earthquakes, a few more the task to talk about flooding and the rest the task to discuss waste disposal.

DBE syllabus reference: "Ecosystem" (FDC114, *Integrated Science 1*, Biology, Unit 4).

During the Activity

Teacher Opoku describes how he does the activity as follows:

I talk to the pupils briefly about what I have planned for the lesson and then I write the following on the board:

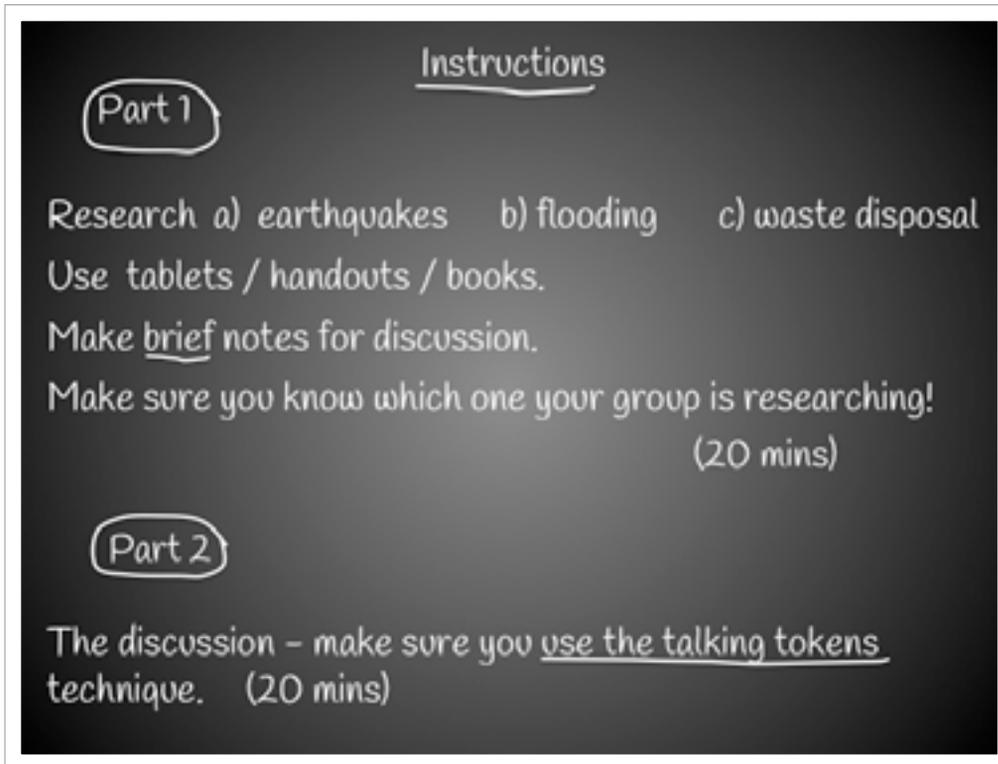


Figure 23. Instructions for the task

The groups work industriously on their research, gathering the information that they will use during their discussion. After 20 minutes researching I draw the class together for Part 2 of the lesson.

I explain the 'Talking Tokens' technique and ask them to make the tokens by folding a piece of A4 paper and tearing it, to give 4 tokens for each group member. I remind the class of their talk rules before leaving them to it.

During this part of the activity I walk around the classroom and listen to the discussions and whilst I do not get to hear all of the points made I am happy that there is an acceptable level of 'good' noise (the sound of on-task discussion) as I walk from group to group. I am pleased to hear many salient points being made and I can hear local language being used on the odd occasion to clarify some points - that's OK too.

After the Activity

Opoku can see that this technique will be very useful to get his pupils to make meaningful contributions on many other topics as it really does make them think about what they are saying before they speak. The quality of

the discussion was definitely higher than on previous occasions. When the pupils have become very familiar with the technique he will think about ways that groups will feedback from their group discussions and what they might write during their discussion (eg some notes that they can put on the wall for other groups to read).

Teacher Discussion



Here are some questions to discuss in your groups after you have read through the 'Talking Tokens' example:

- What do you think of Opoku's rationale for choosing this technique for this topic?
- What resources does he need to bring along to the lesson?
- What resources will you need do a similar activity with your pupils?
- At what stages in the pupils' learning do you think talking points would work best?
- Before you start a topic to find out what pupils know?
- At the end of a topic to find out what they have learned?

Here are some potential problems with the 'Talking Tokens' technique:

- Someone may chose not to talk even though they have tokens.
- Someone may talk for too long when using their token.
- Pupils may not engage with the technique (i.e. not use the tokens but just talk how they want to).

How would you solve these problems?

What will your role be during the 'Talking Tokens' activity?



Figure 24. Students making notes for a group discussion

T3-3 S 2 Plan and Practise Together



Talking Tokens

You are now going to plan your own 'Talking Tokens' activity. Have a look at the syllabus for the year group/s that you will teach and choose a good discussion topic that you can use the 'Talking Tokens' technique with. Here are some further ideas.

JHS

Use 'Talking Tokens' during the discussion stimulated by the following:
"Discuss how earthquakes, volcanic eruptions, hunting, farming, mining, pollution, pesticides and bush burning affect the ecosystem."

Reference: National Syllabus for Integrated Science (Junior High School), JHS 1, Section 6: Interactions of Matter, Unit 1, "Ecosystem".

Upper Primary

There are lots of opportunities for discussion using 'Talking Tokens'. For example, pupils could talk about food processing and preservation, food poisoning or flooding.

Reference: National Syllabus for Integrated Science (Primary 4-6), Primary 6, Section 5: Interactions of Matter, Units 1, 2 and 3.

Lower Primary

There are lots of opportunities for discussion here using 'Talking Tokens'. For example, pupils could talk about personal hygiene, water pollution or water purification.

Reference: National Syllabus for Natural Science (Primary 1-3), Primary 3, Section 5: Interactions of Matter, Units 1, 2 and 3.

English

Pupils use 'Talking Tokens' and take it in turns to describe certain things accurately using relevant vocabulary. Here are some things to describe:

- a chair
- a table
- a pile of books
- a fellow pupil
- a family member etc.

Reference: English Language Syllabus 2012, Primary 4, Section 1: Listening and Speaking, Unit 4, "Conversation".

Maths

Pupils can use 'Talking Tokens' when discussing a graph of some interesting and relevant data, perhaps even some that they have collected themselves. For example they could ask fellow pupils about their favorite pastimes/what job they would like/favorite food etc. and compare the responses of boys and girls.

Each person makes a relevant comment during the discussion by picking a different part of the bar chart to focus on. They give up one 'Talking Token' per comment.

Reference: Primary Mathematics Syllabus 2012, Unit 6.9, "Collecting and Handling Data".

Planning Your Own Talking Tokens Activity



Choose a topic from a lesson you will teach next week that you can use 'Talking Tokens' with. It can be something that pupils have to research and then talk about in their groups (like the example) but it does not have to be. 'Talking Tokens' can be used to manage any group discussion. Plan to use the activity in a way that works well with what you will be teaching next week.

If the pupils are familiar with group work practices you can use some of the following ideas to extend the activity:

- One person will make sure everyone speaks only when they use the token.
- One person will be a scribe and write down a brief bullet point of what is said.
- One person will report back to the rest of the class.

Write the group work instructions in an activity plan; you can find the activity plan template in the appendix. Also write in your plan other planning details (resources needed etc.) that will help you to do the activity successfully with your pupils.



At the end of the planning activity you should have developed an activity plan that you can use in your teaching in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.

T3-3 S 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you

have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-3 S 4 Reflect together



Talking Tokens

Now that you have used 'Talking Tokens' with your pupils, reflect on how it went. Do the reflection together with colleagues who also tried the activity.

In your reflection, consider the following questions:

- How did group members prepare for the discussion?
- Did pupils use the 'Talking Tokens' well during the discussion? How do you know?
- How successful was the technique at managing teachers' contributions to the group discussion?
- Did using the technique bring pupils learning on? How do you know?
- Did the technique ensure that all pupils (especially females) participate equally? Did males still talk first and for longer?
- What will you do differently next time you use the technique? Why?
- How could you adapt the 'Talking Tokens' technique to make it suitable for a whole class dialogue activity?

Remember to write down your thoughts in your learning journal. Also note down what you learned from this session that was most effective in improving your teaching.

Introduction to Teaching Strategy 4

Structuring Talk for Learning

T3-4 i 1 Learning Objectives



By the end of the session teachers will be able to:

- use teaching strategies to structure Talk for Learning;
- recognise how these teaching approaches can help their pupils to learn effectively.

T3-4 i 2 Introduction



When using Talk for Learning you want your pupils to be actively engaged, to participate and to feel free to offer their ideas and thoughts, for example through brainstorming. One of the challenges as a teacher is how to capture these many ideas in such a way that everyone in your classroom can progress their own learning from them. It requires structuring what is being shared, without making it prescriptive.

For example, to get your pupils engaged and involved you might have done a brainstorm on the issue of gender imbalance in different professions in Ghana, jotting down all their ideas on the board. How do you move on from there in a way that will increase your pupils' understanding of the topic of gender equality?

This strategy explores some teaching activities that can help you in structuring those many ideas. They tend to fall into two categories:

- Activities that ask your pupils for their ideas within a certain framework so that it is easier to compare and contrast the different elements of that framework, for example using a writing framework.
- Activities that allow your pupils to categorise the ideas that are offered, by using (for example) a 'Concept Map', 'Diamond Nine', etc.

Here are some ideas for such strategies. They can be used and adapted for many topics, and all subjects. More details are given after the table.

Theme 3: Talk for Learning Teaching Strategy 4: Structuring Talk for Learning		
Aspect	How it works	Section
Concept Maps and Mind Maps	A 'Concept Map' uses lines and arrows to make connections between keywords and concepts whereas a 'Mind Map' has themes, and sub themes radiating from a central idea through 'branches' and later on 'twigs'.	T3-4i
Diamond Nine	This helps to categorise and prioritise key factors of what pupils have to learn. Pupils are asked to order key factors in terms of importance in the shape of a diamond made of 9 elements.	T3-4i
Know, Want to Know, Learnt (KWL)	KWL asks the pupils to identify what they know already about a topic and what they want to know. It also asks them to evaluate what they learned after a lesson.	T3-4E
Plus, Minus, Interesting (PMI)	PMI stands for 'Plus Minus and Interesting'. This strategy for discussion requires pupils to consider pros, cons or interesting aspects of a given scenario.	T3-4S
Structured Posters	Pupils are asked to record their ideas on posters but within a given 'Writing Frame', headings or a table that they have to use. This will make it easier to compare and contrast the ideas given on the posters.	T3-4i
Three Things We Know, Three Things We Do not Know	This strategy involves pupils identifying and discussing what they know and do not know about a topic. The discussion can lead to pupils developing their understanding.	T3-4M
Writing Frames	In 'Writing Frames' the text type is visually laid out and the connectives you want pupils to use to link paragraphs together appear as prompts on the left. The students arrange their ideas around these prompts.	T3-4i

Structured Posters

Ask your pupils to record their ideas on posters and put these on the walls. This will help to keep the thinking process and ideas 'live'. They can also take pictures of the posters to capture what has been shared. To get similar

structures in the posters that will make it easier to compare and contrast you can give them a 'Writing Frame', headings or a table that they have to use.

Concept Maps and Mind Maps

'Concept and Mind Maps' can help to structure the topic or concept in your pupils' minds by providing them with an overview of the topic. It is very useful for categorising ideas from brainstorming. A 'Mind Map' has the main idea or focus in a central node, and the themes and sub themes radiate from this central node through 'branches' and later on 'twigs'. Here are two examples: a 'Mind Map' about equations in mathematics, and a 'Mind Map' about acids and bases in science.

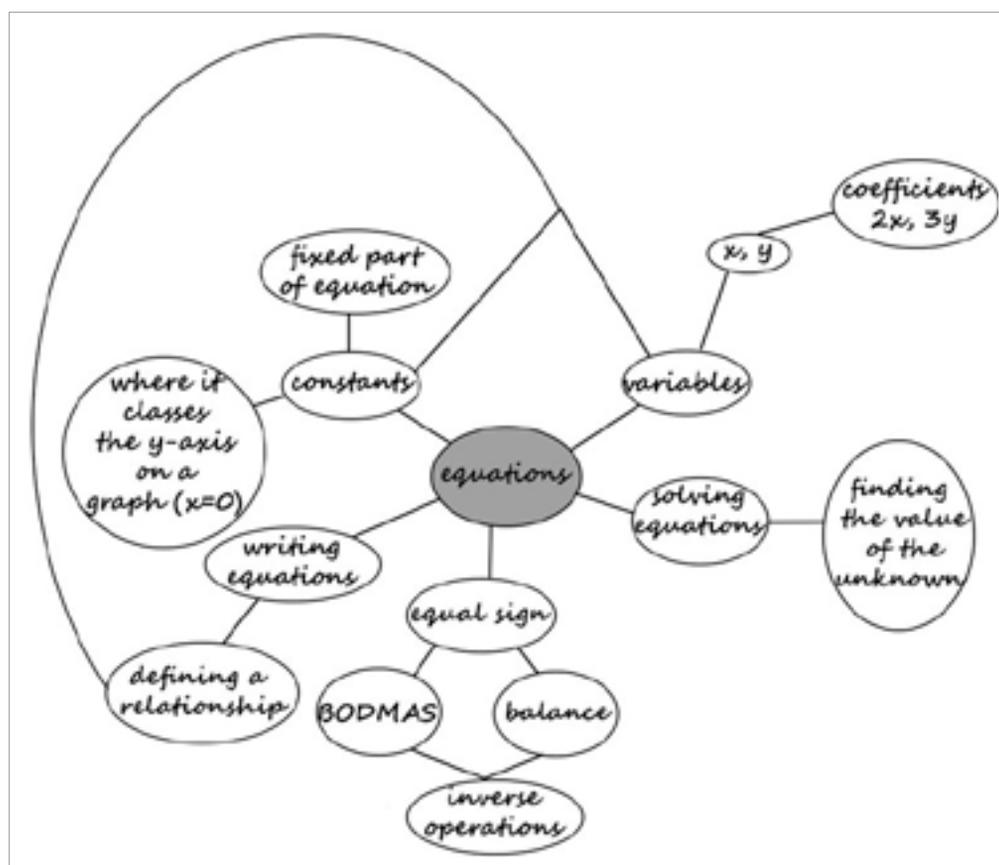


Figure 25. A 'Mind Map' on 'equations' in mathematics

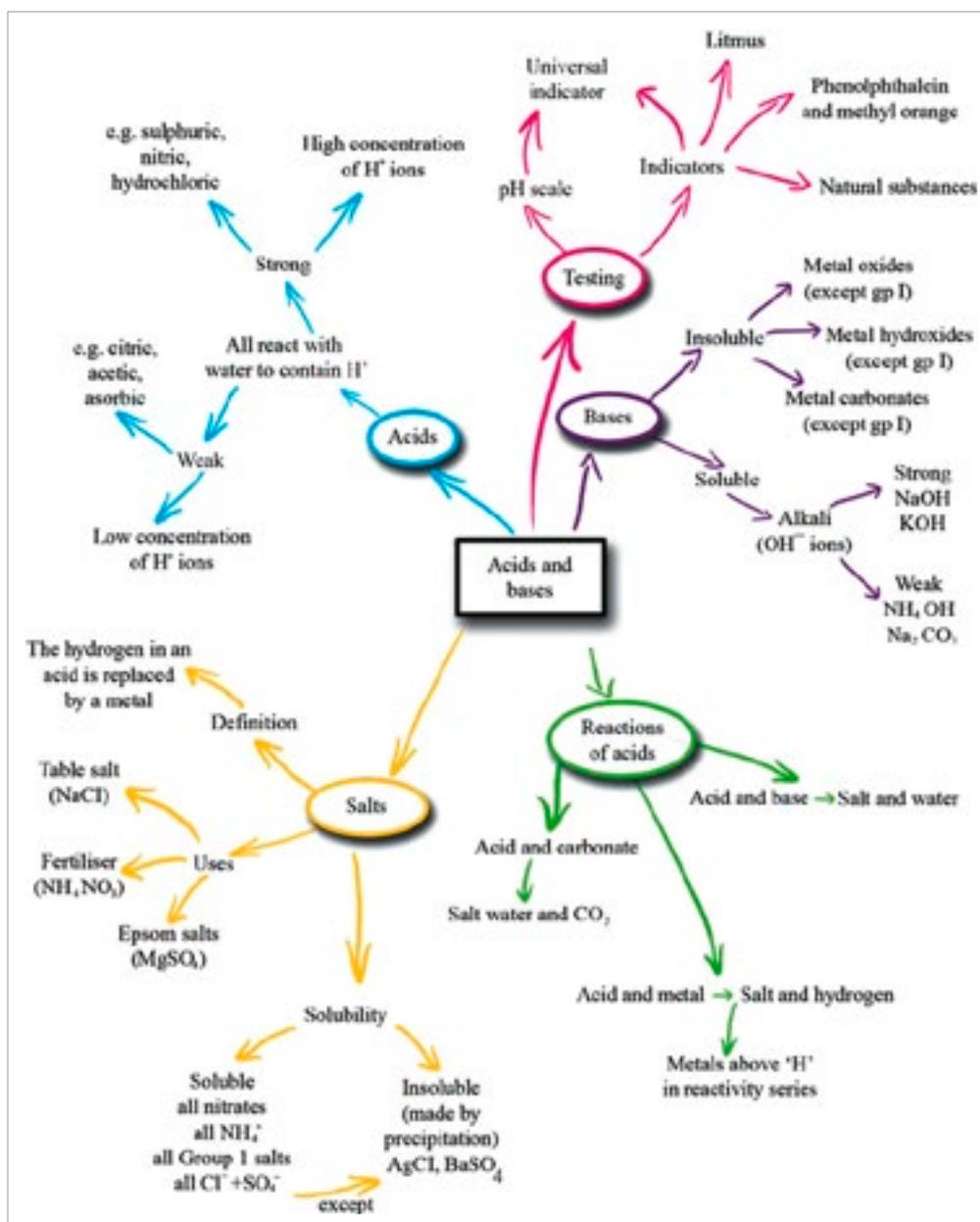


Figure 26. A 'Mind Map' on 'acids and bases' in science

A 'Concept Map' places more emphasis on making connections between keywords and concepts than a 'Mind Map' and uses lines and arrows to make connections between key words. The idea is that the key words and the linking words make a meaningful sentence. A 'Concept Map' is often more linear than a 'Mind Map'. Here is an example of a 'Concept Map' about acids, salts and bases in science.

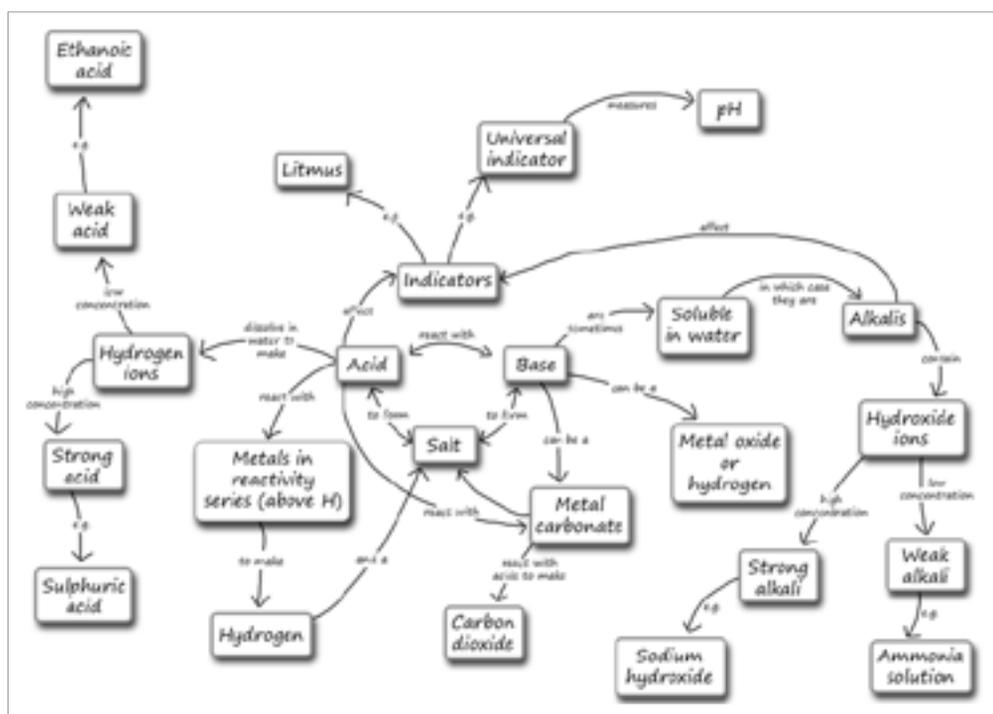


Figure 27. A 'Concept Map' on 'acids, salts and bases'

Writing Frames

'Writing Frames' are used for getting pupils to produce a particular text type, such as a report, a discussion, a persuasive letter. They follow on very well from a brainstorming session because the frame makes pupils organise their ideas into a specified text type.

For example, after a brainstorming activity, give the pupils a 'Writing Frame' with the text type visually laid out and the connectives that they should use to link paragraphs together appearing as prompts on the left. Ask the pupils to arrange their ideas around these prompts. Here is an example:

[my address]	
Urban Development Council [their address]	
[date]	
Dear Sir/Madam	
Garbage collection proposal	
I am writing in support of building a new garbage collection site next outside the town because ...	Opening; state purpose
The main point is that ...	State main position or argument
In addition ...	Supporting argument 1
Moreover ...	Supporting argument 2
Some people think that ...	Counter argument expressed weakly
However, if ...	Counter argument deflated
In short, we should ... because it is my firm belief that the whole community would ...	Summary or reiteration of original position]
Thank you for your kind consideration of this matter.	
Yours faithfully	Closing
[signature, name, title]	

Figure 28. 'Writing Frame' for a persuasive letter

Diamond Nine

This helps to categorise and prioritise key factors of what pupils have to learn. Give the pupils key factors, or ask them to come up with these and write them on cards, post-its or pieces of paper. The pupils then have to order them in terms of importance, in the shape of a diamond made of nine elements. The most important factors are placed towards the top of the 'Diamond Nine'. The least important factors are placed towards the bottom. Equally important factors are placed on the same row. Here is an example of a 'Diamond Nine' about the topic 'alcohol and its effects' which examines

why pupils might want to drink alcohol. This can then be used to address the issues one-by-one to tackle alcohol consumption and abuse.

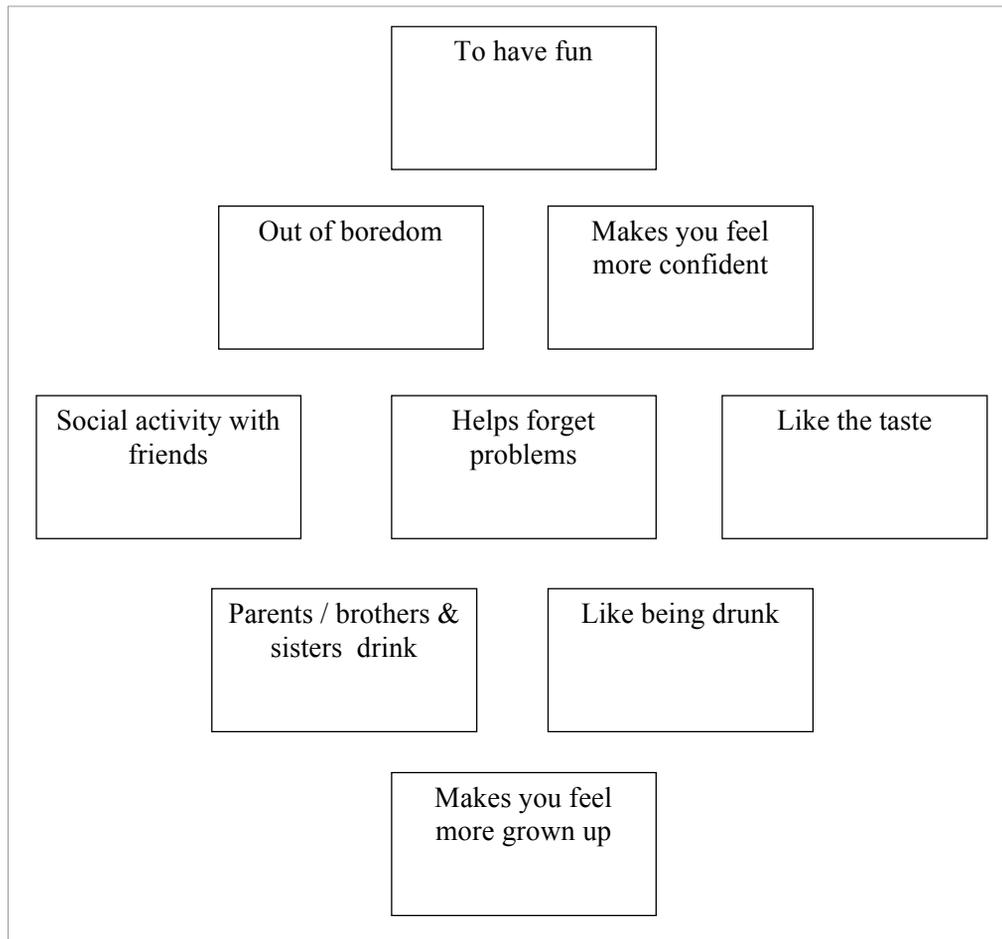


Figure 29. 'Diamond Nine' about alcohol and its effects to tackle alcohol consumption and abuse

KWL: Know, Want to know, Learnt from the lesson

KWL stands for K = Know; W = Want to know; L = Learnt from the lesson. This activity initially draws on what pupils already know about the topic being taught. The teacher then elicits what the pupils want to learn more about, specific to the topic. Finally after the lesson, the teacher goes back to the KWL and elicits what the pupils learnt that was new for them from the lesson.

Three Things We Know, Three Things We Do Not Know

Ask the pupils to decide in their groups or pairs on three things they know and three things they do not know about a topic. It works well if you ask them to do that on cards or post-its so they can move them around from the 'know this' pile to the 'do not know this' pile. They will learn from hearing what other groups will share with them in a clearly structured format.

Plus, Minus, Interesting (PMI)

PMI stands for 'Plus, Minus and Interesting'. It is a strategy for discussion that encourages participants to think about things from other viewpoints and to structure their ideas by considering the pros and cons (P and M) for a given scenario. During discussions some points may be raised which may not be technically a pro or a con but can be considered creative/worth mentioning. These will make up the 'interesting' category. For example: Ask your pupils at the start of a talk activity to come up with three PMIs for the subject they are discussing. Tell them to structure their talk in such a way that they will end up with three positive, three negative and three interesting comments about the subject.



Please refer back to the gender section in the introduction to T3-1, and bear in mind the number of questions asked/answered by males and females, the amount of attention you give, being patient with pupils who may be shy or afraid to talk, and, when doing group work, experiment with different student groupings.

T3-4 i 3 Activity: Mindmaps and Diamond Nine



In this activity you will first of all make a 'Mind Map' which you will then use the 'Diamond Nine' approach with. After the 'Diamond Nine' part of the activity you will compare your results with those from other groups. Here are the steps for the activity:

Step 1: 'Make a Mind Map'. In groups, design with your colleagues a 'Mind Map' about 'The Importance of Religious Tolerance in Ghana' (DBE FDC 219B).

Step 2: 'Diamond Nine'. Pick the nine most important factors of the 'Mind Map'. Use the 'Diamond Nine' approach to categorise and prioritise these factors.

Step 3: 'Compare Your Results'. Go and compare (what is the same) and contrast (what is different) what you produced in your group with what other groups produced.

Teacher Discussion



As a whole group, discuss:

- Did these activities help you in structuring your thinking? What effect did that have on your learning/thinking?
- Were you able to compare and contrast with other groups? What effect did that have on your learning/thinking?
- Is there anything that did not work so well or could be improved? What would you change to make it better?

Make notes of your ideas in your learning journal.

T3-4 i 4 Plan and Practise Together



The next three sections have examples of different activities for structuring Talk for Learning that can be used in all subjects. In your own planning, please use the introduction above if you need further information on the various aspects. Also note that the example provided in each section is just for guidance. Do not spend too long on it, but move straight on to your planning activity.

T3-4 i 5 Prepare for Teach and Reflect



Once you have planned your activity, come back together as a whole group, to see what issues arose. Make a note in your learning journal. After you have taught, write down your own observations and reflections on your activity plan and in your learning journal, and be prepared to share these with others at the start of the next session.

T3-4 i 6 Sources



TESS-India, *Creating contexts for abstract mathematics: equations*. <http://www.open.edu/openlearnworks/mod/oucontent/view.php?id=57353§ion=8.3>, Resource 3: An example of a mind map, http://www.open.edu/openlearnworks/mod/oucontent/view.php?id=57353&extra=thumbnail_idm35045248. Available under Creative Commons Attribution-ShareAlike (<http://creativecommons.org/licenses/by-sa/3.0/>; unless identified otherwise).

TESS-India, *Mind mapping and concept mapping: acids, bases and salts*. <http://www.open.edu/openlearnworks/mod/oucontent/view.php?id=64819>

- Resource 5: Example of a concept map, http://www.open.edu/openlearnworks/mod/oucontent/view.php?id=64819&extra=thumbnail_idp27083728;
- Resource 2: An acids, bases and salts mind map, http://www.open.edu/openlearnworks/mod/oucontent/view.php?id=64819&extra=thumbnail_idp27021712.
- All available under Creative Commons Attribution-ShareAlike (<http://creativecommons.org/licenses/by-sa/3.0/>; unless identified otherwise).

Alcohol education trust - <http://www.alcholeducationtrust.org/teacher-area/effects-physical-and-social/effects-physical-social-lesson-planning/>, <http://www.alcholeducationtrust.org/wp-content/uploads/2014/11/Diamond-Completed.doc> © Alcohol Education Trust 2015. This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.



Teaching Strategy 4

Structuring Talk for Learning in English

T3-4 E 1 Example



How Mr. Zadiq structured Talk for Learning in his Class

Mr. Zadiq is planning for his class tomorrow. He is introducing 'Listening to songs, poems and rhymes,' to his Primary 5 class (Unit 1). He wants his pupils to really engage with the topic so he decides to structure his lesson using KWL (Know; Want to know; Learnt from the lesson). He wants to focus on 'Songs' first.

Before the start of the lesson he first arranges the furniture so pupils work in groups. Then he draws 3 columns on the board like this:

KNOW (already)	WANT (to know more about)	LEARNT (from the lesson)
----------------	---------------------------	--------------------------

He introduces the lesson and asks his pupils to discuss what they already know about the topic in their groups. After 5 minutes he asks for their ideas, taking 2 or 3 ideas from each group and putting them on the board under column 'KNOW'. Then he gives them another 5 minutes to discuss what they want to know more about the topic. He follows the same steps and writes some of the pupils' ideas under the second column 'WANT'.

Mr. Zadiq then gives his pupils some input using a variety of activities. He monitors them as they complete the different tasks. Finally he asks his pupils to discuss in their groups what they have learnt from the lesson. He elicits some ideas and adds them to column 'LEARNT' on the board.

Teacher Discussion



At present:

1. How do you find out what your pupils already know on a topic (their prior learning)?
2. How do you meet the needs of what your pupils need to know ?
3. How do you elicit from your pupils what new things they have learnt?
4. Do you think you could use KWL to structure your Talk for Learning in your own subject area?

Look at the next section and try it out.

T3-4 E 2 Plan and Practise Together



KWL

You are now going to plan your own KWL activity. If the above examples fit what you are teaching, you can use them. However, you may well be teaching something else, so here are some more ideas from various subjects that lend themselves to Talk for Learning, using KWL.

Weather, Season and Climate (JHS 2 Integrated Science Syllabus, Unit 2)

Now plan a lesson on the topic, 'Weather, Season and Climate', and how to structure the lesson to involve pupils to get them to tell you what they know, what they want to know and what they have learnt within the lesson to encourage Talk for Learning.

Measurement, Length, Mass and Capacity (Primary 1-6 Maths Syllabus, Primary 3, Unit 5.5)

Now plan for the topic, 'Measurement, Length, Mass and Capacity.' Think about how to structure your lesson to engage pupils to talk about what they know, what they want to know and what they have learnt about the topic.

Novels: elements of a novel (JHS (1-3) English Language Syllabus, JHS 3, Section 3, Unit 1)

Now plan a lesson on the subject 'Elements of a novel and their importance,' and consider how you would structure your lesson to get pupils talking about what they know, what they want to know, and what they would have learnt at the end of the lesson.

Plan Your Own KWL Activity



Can you use any of the above ideas? Hopefully the above topics give you an idea of how you can use 'design an activity' for use in your classroom. But, as usual, it is possible that those ideas do not fit, and you will need to identify a topic that fits into your weekly lesson forecast.

At the end of the planning activity you should have developed an activity plan that you can use in your teaching in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.



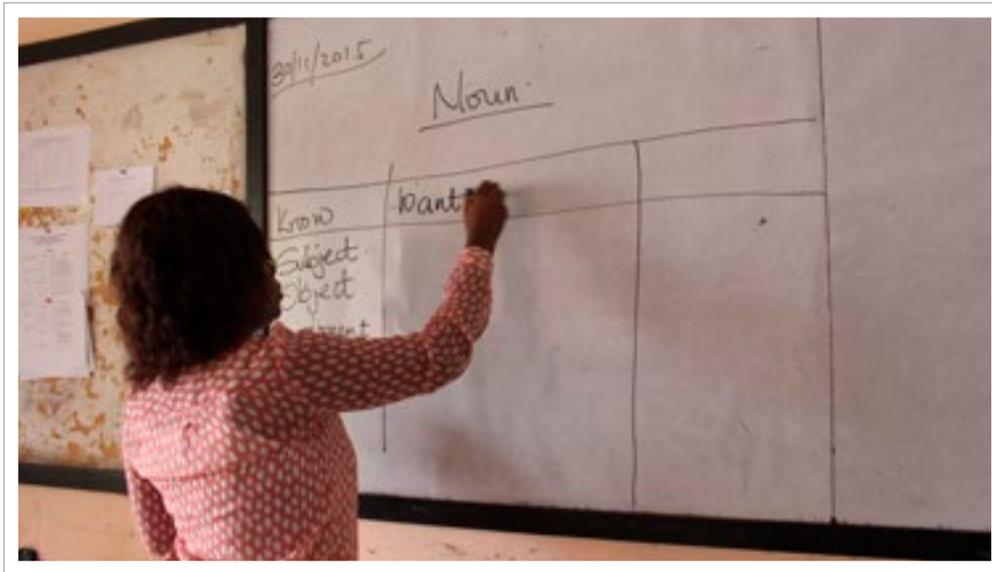


Figure 30. Whole class dialogue using KWL

T3-4 E 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-4 E 4 Reflect Together



KWL

After you have taught a class using KWL, first reflect on your own and answer these questions/statements:

- Note down all the things you felt went very well because of using KWL in your lesson and share it with your peers.
- What was the 'high point' of the lesson for you? Why was this?
- Can you answer the same question from your pupils' point of view?
- Note down the specific points in the lesson where you felt the pupils were learning something due to using KWL.
- Which part of the lesson involved your pupils most completely? Were females and males involved equally?

T3-4 E 5 Further Resources



Planning Your KWL Activity

Why Building on Previous Experience and knowledge Helps Support learning

Try to build in opportunities for pupils to activate prior knowledge as it is an important way of making learning contexts more supportive for all and particularly for those learning through a language other than their own.

As learning occurs mainly through 'linking' new ideas to what we already know, it is usually only when pupils have the opportunity to relate new ideas to previous knowledge and experience that real learning takes place.

Activating prior knowledge allows pupils to connect with prior learning, either to build on what has been learned in previous lessons or to assimilate a new idea or topic. It enables teachers to find out what they already know and understand, can do, believe or are aware of. It also sends explicit messages to pupils that their ideas are of value and that they have an active role to play in the learning.

Strategies for activating prior knowledge include:

- giving a summary of the last related lesson's outcome or focus
- sharing quick ideas at the beginning of a new topic
- concept maps
- bilingual strategies
- KWL grids
- using artefacts, realia and pictures.
- note that the strategies used in teaching vocabulary/ terminologies apply in all subject areas.

More Strategies to Build on Previous Experience and Knowledge in Bilingual and Multilingual Contexts

Here are some more tips on both building and structuring Talk for Learning in the classroom. In particular, you will find these useful for activating previous knowledge. Building on previous experience should be used in any classroom and is particularly useful in bilingual and multilingual contexts. Strategies can include:

- using prior knowledge by sharing initial thoughts, ideas, understandings and experiences
- using culturally familiar starting points, examples and analogies
- starting with the language the pupil knows best, i.e. using bilingual strategies

- creating shared experiences through practical activities, speakers and stories
- using a wide range of assessments for learning e.g. when giving feedback to pupils you can praise in more than one language – try to learn some of the basic communication skills in the language of your pupils so you can say , “well done, that is very good,” etc in their language.



Teaching Strategy 4

Structuring Talk for Learning in Mathematics

T3-4 M 1 Example



Mr Owusu Manages the Many Ideas his Pupils Shared

Mr Osei Owusu teaches mathematics in a school in the Eastern Region. He has been trying out some of the teaching strategies that he learned from the T-TEL materials and it is going well: his pupils are enjoying the interactive teaching and learning a lot from having the opportunity to talk to each other.

He would like to try out a teaching strategy now that would address some particular issues that happen when he is in the middle of teaching a topic: at that moment he wants to consolidate the learning of the topic so far and evaluate the progress of the pupils to inform his planning for the next lessons.

This is Mr Osei Owusu's story of how he went about achieving this:

Evaluating my pupils halfway through a topic to inform my planning for the next few lessons is something I really think is good to do, but up to now, I have not found it a pleasant experience. I just get disheartened by the gaps in knowledge that the pupils seem to have, and the wide variety in those gaps. I can find it really hard to know what to do next: how to structure those different gaps in knowledge into chunks that I can teach quickly? Do I repeat what I taught already? Do I ignore the gaps, move on and hope for the best? Do I waste time on teaching some things that some students already know?

I have experienced that my pupils learn well through Talk for Learning activities. They seem to develop a deeper understanding and I also found these strategies time effective because the pupils seem to learn much more quickly by learning from their peers. Reading about the strategy 'Three Things We Know, Three Things We Do Not Know' I thought this might address my particular issues.

I was in the midst of teaching 'Collecting and handling data' (Primary Maths, unit 6.9). I asked the pupils to work in groups of four or five and do the activity written on the board:

On separate pieces of paper, write

Three things you **do** know about the mean, mode and median of a set of data

Three things you **do not** know about the mean, mode and median of a set of data

I told them it was up to them to decide how to go about it, for example they could decide to first individually write down 5 things they knew, and five things they did not know, and then discuss with each other. I walked around the classroom, observing what they were doing and noticed that many of the 'things I do not know' moved to the 'I know' pile after they taught each other quickly this 'thing I do not know'. I was really happy about that because it would save whole class teaching time. These are some of the things they knew:

there are several averages: mean, mode, median;
do not use the mean as an average to work out the average shoe size.

Some of the things they do not know were:

why it is called this way (such confusing words);
how to decide what average is best to use;
how to work out the median when there is an even number of data

To get all groups to share with the class without taking too much time, I asked each group to first share one example of what 'we know' and wrote these on the board. Then I asked for one example of 'what we do not know' from only three groups and asked whether anyone 'knew' this and could explain. Then we kept adding and discussing.



Figure 31. Student teachers engaging in group work

Teacher Discussion



Discuss with your colleagues:

- Why do you think Mr Owusu structured the group work in this way?
- Do you think the activity allowed for the pupils to consolidate their learning? How?
- How do you think this activity might help Mr Owusu in his planning of the next lessons on this topic?
- It's important to have a sense of what pupils know and do not know. Can you think of any other 'things I do not know' your pupils could have about this topic?
- Do you have any more ideas for sharing the group ideas with the whole class that would be effective?

T3-4 M 2 Plan and Practise Together



Three Things We Know, Three Things We Do not Know

Given the topics that you are teaching this week, the topic in the above example is not likely to work for you. Here are five more ideas that lend themselves for using 'Three Things We Know, Three Things We Do Not Know' to structure the many ideas pupils might have.

Number Plane (Mathematics)

Write down 'Three Things We Know, Three Things We Do Not Know' about drawing graphs of lines.

Reference: 2012 JHS Mathematics, 'Number plane', Unit 2.8, p. 41-42.

Operations on Fractions (Mathematics)

Write down 'Three Things We Know, Three Things We Do Not Know' about operations on fractions.

Reference: 2012 Primary Mathematics, 'Operations on fractions', Unit 5.10, p. 96-99.

Subtraction (Mathematics)

Write down or draw 'Three Things We Know, Three Things We Do Not Know' about subtraction.

Reference: 2012 Primary Mathematics, 'Subtraction 0 - 9', Unit 1.5, p. 7-10.

Science (Integrated Science)

Write down 'Three Things We Know, Three Things We Do Not Know' about reproduction in humans.

Reference: National Syllabus for Integrated Science (Junior High School), JHS 2, Section 3: Systems, Unit 1, "Reproduction in Humans".

Plan Your Own Activity



Can you use any of the above ideas? If not, consult your syllabus and choose a topic from a lesson you will teach next week where you can use 'Three Things We Know, Three Things We Do Not Know'. Plan in detail, you can use the activity plan in the appendix. Take care with selecting the topics as the activity works well for focused topics but not for big general topics. For example, do not ask the pupils what they know or do not know about 'graphs' but about 'linear graphs'.



At the end of the planning activity you should have developed an activity plan that you can use in your teaching in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.

Please make sure that you have noted down everything you need to remember for your lesson in your activity plan.

T3-4 M 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-4 M 4 Reflect Together



Three Things We Know, Three Things We Do Not Know

Here are some prompts for reflection:

- Did the activity 'Three Things We Know, Three Things We Do Not Know' help you to manage the many ideas your pupils shared? How did it support your teaching?

- Did the activity help or hinder your pupils to learn from talking? Please explain how you think this happened.
- Is there anything you could do further to improve this?



Figure 32. Student teachers engaging in group work



Teaching Strategy 4

Structuring Talk for Learning in Science

T3-4 S 1 Example



Using PMI to Structure Talk for Learning

Edward DeBono is known as the father of lateral thinking and he devised many thinking tools including the 'Six Thinking Hats' used for critical thinking. Another one of his tools to help organise thinking is 'Plus, Minus, Interesting', also known as PMI. This one is useful in collaborative environments for structuring group thinking. We are using it here to structure talk during group work.

Teacher Mohammed is giving a lesson on fertilisers next week. He wants to make the lesson interactive so he refers to his professional development teaching strategies booklets. On this occasion he will ask his pupils to make a PMI table as an output of their group discussion as it is useful for them to be able to summarise their thoughts in this way.

Teacher Mohammed's PMI Activity With Pupils

Teacher Mohammad tells his pupils briefly about Edward DeBono and his interesting techniques for developing thinking skills.

Instead of standing here and lecturing you today on everything you need to know about fertilizers I have prepared some information for you to read and I want you to process the information in groups. By talking and thinking together you are more likely to make better sense of the material than if I just tell you about it and you will find it easier to remember the information by puzzling through it yourselves too.

He goes on to explain that to help groups structure their talk they will use a PMI table and he draws an empty table and writes an outline of the PMI technique on the board. He also writes this prompt:

Think about the advantages and disadvantages of using fertilisers to grow crops.

He asks the following questions to make sure that everyone has understood the instructions and he records a bullet point for each column in the table so that they know how to complete it.

Mohammad: Can someone tell me something positive about using fertilisers?

Pupil: They improve crop yield.

He writes it in the table like this:

Positives (P)	Minuses (M)	Interesting points (I)
<ul style="list-style-type: none"> • improve crop yield 		

Mohammad: What about something bad about them? Can anyone think of a reason not to use fertilisers?

Pupil: They can leach away if it rains and so you need to fertilise your crops all over again.

He writes it in the table like so:

Positives (P)	Minuses (M)	Interesting points (I)
<ul style="list-style-type: none"> • improve crop yield 	<ul style="list-style-type: none"> • leach away so need to be replenished 	

Mohammad: Now here's where we get creative. That's another one of DeBono's things. Creative thinking is a very useful skill for problem solving - amongst other things. So, can anyone tell me something interesting about fertilisers? Something you've heard on the news perhaps?

Pupil: I've heard that they can cause cancer.

He finishes off like so:

Positives (P)	Minuses (M)	Interesting points (I)
<ul style="list-style-type: none"> • improve crop yield 	<ul style="list-style-type: none"> • leach away so need to be replenished 	<ul style="list-style-type: none"> • some people think fertilisers can cause cancer

Mohammad leaves his unfinished table on the board as he will add to it later (or maybe he will get some pupils to complete it) during the lesson plenary.

He reminds the pupils to make sure that there are at least five points in each column and to complete one column before moving on to the next one. They should aim to spend the same amount of time on each column (about five minutes) working from P to M to I.

After handing out the reading material to the groups they get underway with their PMI task and he walks around the room offering guidance when needed.

DBE syllabus reference: "Types of fertiliser" (FDC124, *Integrated Science 2*, Agriculture, Unit 1).



Figure 33. Pineapples growing in fertilized sandy soil

Teacher Discussion



Teacher Mohammad wrote an outline of the PMI technique on the board. What do you think he wrote? Fill in the table with your ideas.

Outline of the PMI technique

- P = plus points about something (advantages), M = minus points about something (disadvantages) and I = interesting points about something
-
-
-

Here are some further points for discussion:

- How would you adapt the example (and your instructions) so that the pupils can include information on organic and inorganic fertilisers in their PMI chart?
- Discuss the different ways of taking feedback from the groups when they have completed the activity.
- How could you ensure that females and males are participating fully and equally during discussion and feedback?
- What are the advantages and disadvantages of doing the PMI activity in groups rather than a whole class dialogue activity?
- Can you anticipate any difficulties when using this technique? How would you cope with these?
- What types of groups can you see this activity working with?

- What should pupils write in their books after doing the activity?

T3-4 S 2 Plan and Practise Together



PMI

You are now going to plan your own PMI activity. Have a look at the syllabus for the year group/s that you will teach and choose a topic that you can use the PMI technique with. Here are some further ideas.

JHS

Do a PMI on the advantages and disadvantages of the different farming systems (land rotation, crop rotation, mixed cropping etc.). You could combine these in one PMI table or do separate tables.

Reference: National Syllabus for Integrated Science (Junior High School), JHS 1, Section 4: Systems, Unit 1, Farming Systems, “differentiate between different farming systems”, 4.1.1.

Upper Primary

PMI on advantages and disadvantages of making a (named) toy or tool out of metal (or non-metal).

Reference: National Syllabus for Integrated Science (Primary 4-6), Primary 4, Section 1: Diversity of Matter, Unit 1, Metals and Non-metals, “Make simple tools and toys from metals”, 1.1.6.

Lower Primary

Do a whole class PMI on teeth brushing and/or bathing. Pupils talk in pairs for a few minutes about the plus points and these are added to the chart by the teacher before moving on to the minus points and the interesting points in the same way.

Reference: National Syllabus for Natural Science (Primary 1-3), Primary 1, Section 5: Interactions of Matter, Unit 1, “Personal Hygiene”.

English

Pupils work in groups and talk about personal and social values. They discuss the values of honesty, hard work and patriotism and decide which is more important for the development of the nation. Groups use a PMI chart to organise their thoughts.

Reference: National Syllabus for English Language (Junior High School), JHS 1, Section 1: Listening and Speaking, Unit 3, “Conversation”.

Maths

Pupils work in groups to solve a number of problems on direct proportion eg. Two books cost GH¢12. Find the cost of 7 of the books etc.

They use these two different methods:

- the unitary method
- the ratio method

After completing the problems they construct a PMI chart comparing the methods. They state the positive points (good things) about each method first before moving on to the minus points (bad things) and the interesting points (other things they noticed).

The activity can be structured as part whole class work and part group work. You may want to go over the solutions to the problems as a whole class before groups draw up their PMI table. You can try these alternative ways of doing the PMI part of the activity:

- Do the table in groups first and then as a whole class activity during the plenary.
- Do the table as a whole class activity after allowing pairs of pupils to discuss their ideas.

Reference: Primary Mathematics Syllabus 2012, Unit 6.7, "Ratio and Proportion".

Planning Your Own PMI Activity



Choose a topic from a lesson you will teach next week that you can use the PMI technique with. It should be something that pupils have to organise their thinking about. Think about where pupils will get the information from to construct their PMI chart (internet/textbook/notebook/handouts?). Decide if you will use whole class dialogue or group work to do the activity. If you decide to use whole class dialogue remember to let the pupils guide the talk and take on the responsibility of making sure that they all contribute to the activity.

Write the PMI instructions in an activity plan; you can find the activity plan template in the appendix. Also write in your plan other planning details (resources needed etc.) that will help you to do the activity successfully with your pupils. Complete the PMI chart yourself as part of your planning. This will help you to guide the pupils as they do the activity.



At the end of the planning activity you should have developed an activity plan that you can use in your teaching in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.

T3-4 S 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-4 S 4 Reflect Together



PMI

Now that you have taught the lesson activity, reflect on how it went. If at all possible, do the reflection together with a colleague who has also tried the activity.

As part of your reflection, complete the following PMI chart with other members of the group on how the PMI activity with your pupils went for you (remember to talk about and record the Ps first before moving on to the Ms and then the Is):

P (what went well)	M (what was not so good)	I (what interesting things did you notice)

Make a note of any hints that you would give to someone trying the PMI activity for the first time. Use the information in the chart to help you.

Remember to write down your thoughts in your learning journal. Also note down what you learned from this session that was most effective in improving your teaching.

T3-4 S 5 Further Resources



PMI Tables

Here is the filled in PMI table from the example.

PMI on Organic and Inorganic Fertilisers:

Positives (P)	Minuses (M)	Interesting points (I)
<p>Inorganic fertilizers:</p> <ul style="list-style-type: none"> • they improve crop yield • nutrients are ready made for plants • affordable and accessible • exact ratio of nutrients being used is known 	<p>Inorganic fertilizers:</p> <ul style="list-style-type: none"> • leach away so need to be replenished • chemicals in the fertilizer can damage plant roots • can deplete natural soil nutrients and minerals • frequent use can lead to chemical build up which can leak into fruits • fertilizers decrease the shelf life of vegetables and fruits 	<p>Inorganic fertilizers:</p> <ul style="list-style-type: none"> • some people think fertilizers can cause cancer • genetically modified organisms (GMO) • drought resistant seeds • supermarkets sell only good quality crops • some fertilizers also contain weedicide to kill weeds • cocoa farmers are being given free fertilizers
<p>Organic fertilizers:</p> <ul style="list-style-type: none"> • improves soil structure • no toxic build-up of chemicals in plants (poison free) • you are less likely to harm plants since it is slow in working • made from plant or animal waste so sustainable 	<p>Organic fertilizers:</p> <ul style="list-style-type: none"> • can be very expensive • amount of nutrients going into plants is usually guessed • nutrients are not ready-made for plants since it takes time to breakdown • can be smelly in the environment 	<p>Organic fertilizers:</p> <ul style="list-style-type: none"> • poultry droppings are very good for plant growth • crops can vary in quality (crooked carrots/straight carrots)

T3-4 S 6 Sources



Image: "Pineapples growing in fertilized sandy soil" - by Hiroo Yamagata, Flickr. CC BY-SA 2.0. <https://www.flickr.com/photos/hiyori13/31685467/in/set-706066>

Introduction to Teaching Strategy 5

Expressing Yourself with New Words

T3-5 i 1 Learning Objectives



By the end of the session teacher will be able to:

- Use teaching strategies to help pupils improve their learning of language whether this is their mother tongue, additional, scientific, technical or mathematical language;
- Show how these teaching approaches help pupils to learn more effectively.

T3-5 i 2 Introduction



One of the reasons Talk for Learning activities are such effective learning tools is that they give your pupils opportunities to rehearse and practise expressing themselves about their thinking. This is important for all students, but arguably becomes even more important for pupils who are also English Language Learners (ELL), and those with culturally diverse backgrounds. Learning a language – which includes studying or improving your mother tongue, an additional language, or subject specific languages – involves identifying words and expressions, using them in different contexts and phrases, and giving them meaning. To learn a language effectively you need to regularly hear it, see it, read it, write it, and practise speaking it. Murray (2004) argues that one needs to use a word at least 30 times in order to own it! That requires a lot of opportunities to practise vocabulary.

Some maths experts who have looked into language learning (Kersaint and colleagues) suggest five principles for supporting this:

1. provide many opportunities to read, write, listen, and discuss in a variety of ways;
2. draw attention to patterns of language structure, e.g. English, scientific and mathematical language;
3. allow plenty of time to use and develop the language;
4. allow learners opportunities to notice their errors and to correct what they are saying (e.g. through having another go at what they were saying, requesting clarification, elicitation by pausing, repetition of what pupil says by the tutor); and
5. construct activities that allow learners to have the maximum time to interact with others.

In the table below are ideas that provide opportunities to use some of the above principles in your daily teaching. These ideas can be used and adapted for many topics and all subjects.

Theme 3: Talk for Learning Teaching Strategy 5: Expressing yourself with New Words		
Aspect	How it works	Section
Dealing with New Words	The first step in choosing a strategy to help you deal with new words involves determining how essential the new word is for understanding the text (is it a key word?) and how difficult the new word is. Thereafter context clues and decoding strategies can be used.	T3-5E
Personal Dictionaries	Pupils make their own dictionaries of mathematical words and add to these over time.	T3-5M
Talk Like An Expert	This strategy gives pupils the opportunity to read, write and listen to new words as well as speak using them.	T3-5S

Dealing With New Words in Texts Using Context Clues

Pupils can work out the meaning of essential new words in context in the following ways:

- **Keep Reading:** Students can continue reading after the new word. Most readers just stop when they reach a word they don't know. In fact, students can keep reading right to the end of the text in order to prioritise key unknown words.
- **Compare Repetitions:** Students can look to see if the word is repeated later. If it is, students can compare the usage in two contexts.
- **Examine Surrounding Words:** Most of the context clues that help students work out meanings occur within 5 to 10 words before and after the unknown word, so students can be trained to read those surrounding words carefully.
- **Check by Substituting Synonyms:** Students can also learn to check their guesses. They can check the part of speech by using a synonym of their guess, putting the synonym in the passage instead of the unknown word and seeing if the passage then makes sense. Most wrong guesses come from guessing the wrong part of speech. Students can also check that any affixes in the unknown word agree with the guess.

Dealing With New Words in Texts Using Patterns of Language Structure

Finding patterns in words and identifying root words can help pupils understand the meaning of new words that they encounter.

- **Decode From Inflections, Grammar:** Students can find the part of speech of the unknown word from endings and grammar patterns: *-ed*, *-ing* or *-s* and preceding auxiliaries like *is*, *can* or *have/has* will denote a verb; *-ly* an adverb, and articles or quantifiers will precede a noun. Proper nouns – particularly people’s names – confuse students but can be identified by capital letters. Adverbs and adjectives can generally be identified by their sentence position, and usually can be ignored because the passage will make sense without them.
- **Decode From Roots and Affixes:** Students can learn word derivatives, for example prefixes of negation and opposites (*un-*, *dis-*, *in-*, *non-*), suffixes that transform words to other parts of speech (*-ify*, *-able*, *-ful*), and roots (*sign-*, *-phone*, *-scope*) to deconstruct words and increase the accuracy of their guess.

Personal Dictionaries and Word Walls

These provide pupils with the opportunity to write new words and can help with remembering them. A word wall can be built up as a topic is taught with new words being added to it as they are encountered. Pupils can also add the words from the word wall to their own personal subject specific dictionaries.

Talk Like an Expert

The activity ‘Talk like an Expert’ gives pupils the opportunity to read, write and listen to new words as well as speak using them. The tutor writes a paragraph on a relevant topic that uses interesting vocabulary (expert words) and gives the pupils a list of the expert words that are in the paragraph. They tick off the words as the tutor models talking like an expert by reading out the paragraph. They then use the same words to write their own paragraph and read them out to the class. Others tick off the words as they listen.

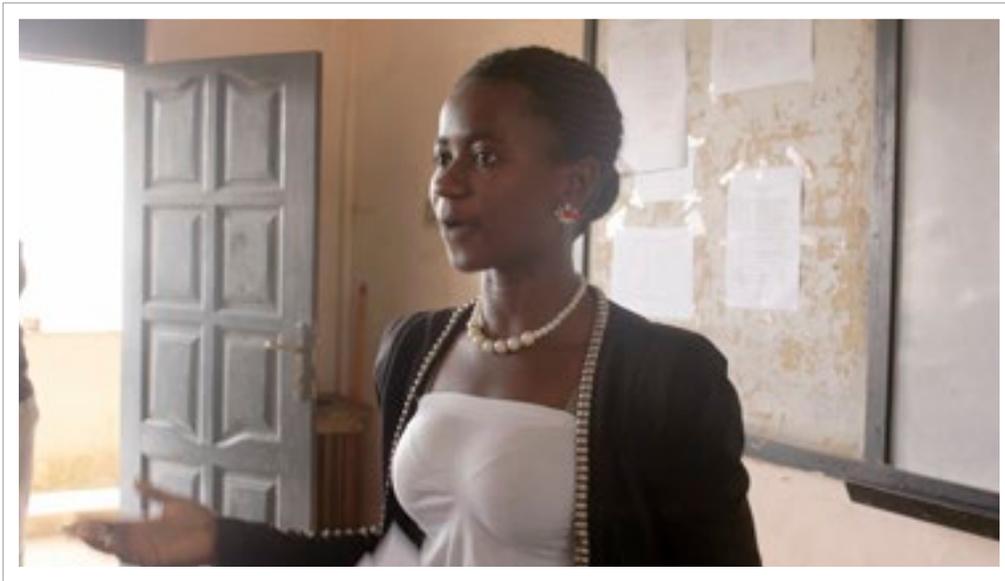


Figure 34. Student teacher 'Talking Like an Expert'



Please refer back to the gender section in the introduction to T3-1, and bear in mind the number of questions asked/answered by males and females, the amount of attention you give, being patient with students who may be shy or afraid to talk, and, when doing group work, experiment with different student groupings.

T3-5 i 3 **Activity: Talk Like an Expert**



Try out the 'Talk Like an Expert' strategy with your colleagues as follows:

- One member of the group reads out the paragraph about interventions and treatment of HIV/AIDS to the other group members.
- Other group members tick off the expert words from the list.
- Group members then work in pairs to write their own version of the paragraph using the same words.
- Each member of the pair practises what they will say when they 'Talk Like an Expert'.
- Pairs take it in turns to 'Talk Like an Expert' (by reading their new paragraph out or speaking from memory using the list of expert words as a prompt) to the whole class who tick off the words.

Here is a paragraph about interventions and treatment of HIV/AIDS that has some interesting vocabulary:

When the human **immunodeficiency** virus (HIV) enters a person's system it causes what is known as HIV infection. Without any **intervention** this **progresses** to the acquired immune deficiency syndrome (AIDS) stage. However the good news is that when one finds out through Voluntary Counselling and Testing (VCT) during the **asymptomatic** stage, treatment in the form of antiretroviral **therapy** can be **administered**. Depending on the type of **antiretroviral** drug, this can either prevent the virus from entering the white blood cells or, where it has already entered, from **replicating** itself and destroying the cells.

Here is a list of expert words in the paragraph:

- immunodeficiency
- intervention
- progresses
- asymptomatic
- therapy
- administered
- antiretroviral
- replicating

Teacher Discussion

Afterwards discuss with your colleagues:

- What was the effect of the activity 'Talk Like an Expert' on your use of language?
- What was the effect of the activity 'Talk Like an Expert' on your understanding of the key words?
- What did you find hardest to do? Discuss with your colleagues some ideas to overcome this.

Make notes of your ideas in your learning journal.

T3-5 i 4 Plan and Practise Together



The next three sections have examples of different activities for expressing yourself with new words that can be used in all subjects. In your own planning, please use the introduction above if you need further information on the various aspects. Also note that the example provided in each section is just for guidance. Do not spend too long on it, but move straight on to your planning activity.

T3-5 i 5 Prepare for Teach and Reflect



Once you have planned your activity, come back together as a whole group, to see what issues arose. Make a note in your learning journal. After you have

taught, write down your own observations and reflections on your activity plan and in your learning journal, and be prepared to share these with others at the start of the next session.

T3-5 i 6 Further Resources



Review Teaching Strategies and the Five Principles for Supporting Language Learning

Think of the teaching activities you have tried out in the last few months and look at the notes you made about this in your learning journal. Discuss in groups with your colleagues whether and how you used any of the following five principles for supporting language learning (Kersaint et al, 2013):

1. allow many opportunities to read, write, listen, discuss in a variety of ways;
2. draw attention to patterns of language structure, eg English, scientific and mathematical language;
3. allow plenty of time to use and develop the language;
4. allow learners opportunities to notice their errors and to correct what they are saying (eg through having another go at what they were saying, requesting clarification, elicitation by pausing, repetition of what pupil says by the tutor); and
5. construct activities that allow learners to have the maximum time to interact with others.

Make notes of your ideas in your learning journal.

T3-5 i 7 References



Kersaint, G., Thompson, D. R., & Petkova, M. (2013). *Teaching mathematics to English language learners* (2nd Edition). New York: Routledge.

Murray, M. (2004). *Teaching Mathematics Vocabulary in Context*. Portsmouth, NH: Heinemann.

T3-5 i 8 Sources



Mesh guides, *Mathematics, Reading, and Writing*, <http://www.meshguides.org/category/mathematics/mathematics-reading-and-writing/>, licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

TESS-India, *Building mathematical resilience: similarity and congruency in triangles*, <http://www.open.edu/openlearnworks/pluginfile.php/134980/>



mod_resource/content/2/SM05_V2_PDF.pdf, available under Creative Commons Attribution-ShareAlike (<http://creativecommons.org/licenses/by-sa/3.0/>; unless identified otherwise).



Teaching Strategy 5

Expressing Yourself With New Words in English

T3-5 E 1 Example



How Mr. Anyanful Helps his Pupils Deal With New Words

Mr Anyanful is preparing his lesson for JHS 3, Unit 1, reading Comprehension. He wants to help his pupils to use different strategies for introducing and dealing with new words so that they can help each other in their language learning.

Now read how Mr. Anyanful deals with the new words with his pupils.

When I am preparing a reading text for a class, the first thing I do is underline all the 'new' words. Then I need to make some decisions about how to deal with these words. This depends on two things: how essential the new word is for understanding the text (is it a key word?) and how difficult the new word is. Here are the decisions I can make taking these two things into account:

- If the new word/expression is essential for understanding the passage and at the pupils' level, it can be taught actively: listen or read, repeat, spell, record.
- If the word/expression is essential but above the pupils' level, it can be taught passively: I can explain it briefly, give a quick translation or get pupils to look it up in a dictionary.
- If the word/expression is not essential for understanding the passage, and is somehow self-defined in the text, pupils can work out the meaning from the context for themselves.
- If the word is low frequency, above the pupils' level, and the passage can be understood without it, pupils can ignore it.

Reference: 'Teaching Reading Comprehension' (*Methods of Teaching English in Basic Schools* FDC 211).

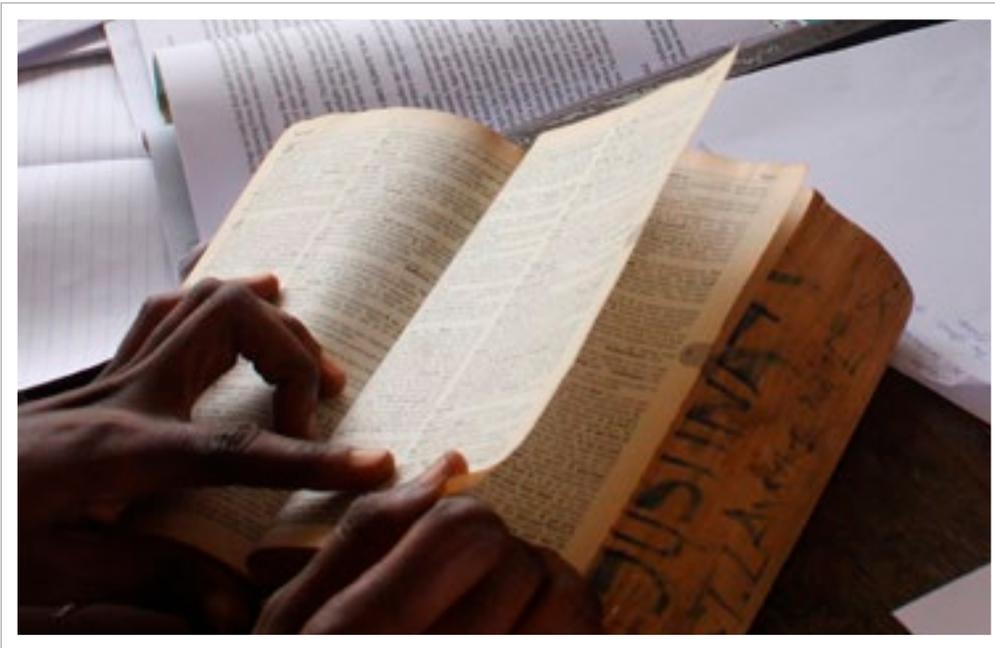


Figure 35. Using a dictionary to look up new words

Teacher Discussion



1. List the problems your pupils might face when dealing with new words in a reading passage.
2. How would you teach new words or terminologies that are essential for understanding your lesson? Think of strategies your pupils could use.
3. How would you handle a new word or terminology that is essential to understanding but above the understanding of your pupils ?
4. Would you have to explain self-defining words or terminologies to pupils in your lessons? Why/ why not?
5. How can the above strategies in the example be used to develop language skills other than reading?
6. How does learning new words/terminology help pupils express themselves?

Complete the table to show how Mr Ayanful deals with new words.

If the word/ expression is at the pupils' level	... above the pupils' level
... essential for understanding the passage and ...	<i>pre-teach carefully</i>	
... not essential for understanding the passage and ...		

T3-5 E 2 Plan and Practise Together



Dealing With New Words in Texts

You are now going to plan your own 'dealing with new words' activity. If the above examples fit what you are teaching, you can use them. However, you may well be teaching something else, so here are some more ideas from various subjects that lend themselves to 'dealing with new words' type activities.

Photosynthesis (JHS 2 Integrated Science Syllabus, Unit 1)

Now plan and practise a lesson in biology on the topic, 'Photosynthesis' and how you would deal with the new words/terminologies to your pupils. Example, photosynthesis, starch.

Measurement of Time and Money (Primary Maths Syllabus, Primary 3, Unit 3.10)

Now plan and practise a lesson on the topic, 'Measurement of Time and Money.' How would you introduce your pupils to new words/terminologies? Example: Token coins, hours, estimate, measure, minutes, calendar, dates, birth, half past, quarter to, cost, change clock, duration.

Idioms and Idiomatic Expressions (Primary 1-4 English Language Syllabus, Unit 8)

Now plan and practise your lesson for 'Idioms and Idiomatic Expressions.' Ensure your plan indicates how you would enable your pupils to understand the new words and terminologies in the lesson. Example: the black sheep; to tell a tall story; to pull someone's leg etc.

Remember all your plans should take into account the strategy 'expressing yourself with new words.'

Plan Your Own New Words Activity



Can you use any of the above ideas? Hopefully the above topics give you an idea of how you can design an activity for use in your classroom. If those ideas do not fit, you will need to identify a topic that fits into your scheme of work and use it.

Have a look under section T3-5A5 Further Resources below and use the information there to help with your planning as follows:

- The checklist will help you think about your context, your pupils, and how you can support all your pupils to deal with new language.
- The handout will give you some more strategies for helping pupils to work out the meaning of words from context clues.



At the end of the planning activity, you should have developed an activity plan that you can use in your teaching in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially females, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.

T3-5 E 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-5 E 4 Reflect Together



Dealing With New Words in Texts

Now that you have tried some of these teaching strategies in your class, reflect on the following questions:

- What have you learned about your pupils' ability to discover and use new words/expressions? Did they use any of the above strategies? Which ones and how?
- Did females and males participate and benefit equally from this activity? If not, how could you give more support to ensure equal learning outcomes?
- What have you learned about yourself in your planning and teaching by using these 'new word strategies' yourself?

- Have these strategies given you any new insights about the learning process? If so, explain.

T3-5 E 5 Further Resources



A Checklist for Planning in Bilingual and Multilingual Contexts

Have you...	Yes	No
clearly identified the language demands of the activities e.g. vocabulary, structures?		
included content that is meaningful, relevant and of interest to your pupils?		
made links with pupils' prior knowledge both in terms of language and content?		
made sure the sequence of activities supports your pupils' level of progress?		
provided plenty of opportunities for listening and speaking through a variety of work arrangements/ seating?		
provided opportunity for second language learners to use their first language for their learning?		

A Handout on How to Deal With New Words and Expressions in Texts

How to Deal with New Words and Expressions

You can help your pupils deal with new words by using the following strategies for working out the meaning of words from context clues.

1. Keep Reading

Pupils can continue reading after the new word. Most readers just stop when they reach a word they don't know. In fact, pupils can keep reading right to the end of the text in order to prioritise key unknown words.

2. Compare Repetitions

Pupils can look to see if the word is repeated later. If it is, pupils can compare the usage in two contexts.

3. Examine Surrounding Words

Most of the context clues that help pupils work out meanings occur within 5 to 10 words before and after the unknown word, so pupils can be trained to read those surrounding words carefully.

4. Decode From Inflections, Grammar

Pupils can find the part of speech of the unknown word from endings and grammar patterns: *-ed*, *-ing* or *-s* and preceding auxiliaries like *is*, *can* or *have/has* will denote a verb; *-ly* an adverb, and articles or quantifiers will precede a noun. Proper nouns – particularly people's names – confuse pupils but can be identified by capital letters. Adverbs and adjectives can generally be identified by their sentence position, and usually can be ignored because the passage will make sense without them.

5. Decode From Roots and Affixes

Pupils can learn word derivatives, for example prefixes of negation and opposites (un-, dis-, in-, non-), suffixes that transform words to other parts of speech (-ify, -able, -ful), and roots (sign-, -phone, -scope) to deconstruct words and increase the accuracy of their guess.

6. Check by Substituting Synonyms

Pupils can also learn to check their guesses. They can check the part of speech by using a synonym of their guess, putting the synonym in the passage instead of the unknown word and seeing if the passage then makes sense. Most wrong guesses come from guessing the wrong part of speech. Pupils can also check that any affixes in the unknown word agree with the guess.

Teaching Strategy 5

Expressing Yourself With New Words in Mathematics

T3-5 M 1 Example



How Mrs Anyanful Helped Her Pupils Develop Fluency in Talking Mathematically

Mrs Anyanful teaches mathematics at JHS level in a school in the Eastern Region. She has been trying out some of the teaching strategies that she learned from the T-TEL materials. She is pleased with the change in the learning, enjoyment and motivation that has happened. She herself is also feeling more professional pride and has become more confident in trying out different teaching strategies and changing and adapting her 'normal' teaching practice.

The pupils that attend her school come from diverse educational and language backgrounds. Mrs Anyanful had noticed that there were some language issues that hindered their learning of mathematics.

This is Mrs Anyanful's story of how she went about addressing this:

My classes are truly multilingual with many different languages as mother tongues such as Akan, Ewe, Dangme, Dagbani, Hausa, Moshe and Fante. I have noticed that all JHS pupils can express themselves well in English in social situations; however, in the classroom, especially when talking mathematically and using mathematical expressions, pupils who do not have English as mother tongue struggle. I think this is hindering their learning and progression. The comment in the introduction section to this teaching strategy that you need to use a word at least 30 times in order to own it made me think. I do a lot of Talk for Learning activities already but I actually do not give a lot of opportunities for the pupils to write or define the mathematical terminology. I think some of the confusion arises because some mathematical words are also used in everyday language, but have a totally different meaning. For example 'plane' as in 'airplane' and as 'a flat 2-dimensional space' in mathematics. I decided to try out the teaching strategy of asking the pupils to 'make their own dictionaries' to see whether this would help.

I told my pupils in advance that we would be working on developing a personal dictionary for maths, and this would be ongoing. Bringing a separate notebook to make that their 'dictionary' could be helpful. Of course they could also use their existing notebook or write on loose sheets.

We had been working on geometry so I decided to focus on geometrical vocabulary of rigid sets and enlargements and similarities (JHS 3.2 and 3.3, pp54-59). In the lesson, I asked the pupils to work in pairs or groups of three and gave them the 'Making your Own Mathematical Dictionary' activity.

Making your Own Mathematical Dictionary

Look at your notes on shape and space in your notebook, and at the course outline for this course.

1. Write down a list of geometric words that are being used.
2. Look at those words – are there any words that are also used in everyday life? Do they have the same meaning in everyday life or is the meaning different? What about the meaning of that word in other subjects? What is the same and what is different between the geometric meaning and the other meanings?
3. Write down your own explanation of the geometric words. It might help to add a sketch or drawing as well.
4. Check with your neighbour whether your explanation makes sense by talking it through. Make amendments and refinements if needed.

I was actually a bit surprised by how extremely productive this activity was for both pupils and me: the pupils had an opportunity to really work on the language aspect of mathematics, in writing, reading and verbalising it. For me, it made me realise to what extent the language used in mathematics is alien to the students and a barrier to their learning of mathematical ideas. I really want to spend more time and attention on the language learning of mathematics in the future – if the words have no meaning for them, then how can they learn about them? Since this lesson, I have been doing this activity in all topics – often I set it as work to be completed at home. I have noticed an improvement in the pupils fluency in talking mathematically and also in their confidence to do this. I think it also gave them some skills and experience on how to deal for themselves with making sense of mathematical language which can help them get unstuck when learning mathematics.

Teacher Discussion



Have a look at *Section 5: Examples of Entries of a Pupil's Personal Mathematical Dictionary*. Discuss with your colleagues:

- If you wrote an entry in your own dictionary about similar triangles, would you find the format given suitable or would you like to make some changes to it?
- How do you think making personal dictionaries would help your learning? How would it help your pupils?

T3-5 M 2 Plan and Practise Together



Making Your Own Dictionary

Given the topics that you are teaching this week, the topic in the above example is not likely to work for you. Here are four more examples that lend themselves to using the same strategy of 'Making Your Own Dictionary' to support your pupils to improve their learning:

Algebraic Expressions (Mathematics)

Ask the pupils to make entries in their own mathematical dictionary for the algebraic terminology that is not clear to them.

Reference: 2012 JHS Mathematics, 'Algebraic Expressions', Unit 1.9, p. 22-23.

Word Problems (Mathematics)

Ask the pupils to make entries in their own mathematical dictionary for the terminology and phrasing used in word problems involving multiplication that is not clear to them.

Reference: 2012 Primary Mathematics, 'Multiplication of numbers', Unit 3.7, p. 52.

Collecting and Handling Data (Mathematics)

Ask the pupils to make entries in their own mathematical dictionary for the terminology and phrasing used in collecting and handling data that is not clear to them.

Reference: 2012 Primary Mathematics, 'Collecting and Handling Data II', Unit 5.12, p. 201.

Plan Your Classroom Activity



Can you use any of the above ideas? If not, consult your syllabus and choose a topic from a lesson you will teach next week where you can use making personal dictionaries. At the end of the planning activity you should have developed an activity plan that you can teach in the coming week. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week. Here are your planning tasks. You can use the activity plan template found in the appendix.

1. In groups think of a lesson and a topic that you will teach in the coming week.
2. Identify in these topics where you can ask your pupils to develop their personal dictionaries. Remember the aim is to support them in improving their learning through stimulating Talk for Learning.
3. Plan the activity in detail.



At the end of the planning activity you should have developed an activity plan that you can use in your teaching in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.

Please make sure that you have noted down everything you need to remember for your lesson in your activity plan.

T3-5 M 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-5 M 4 Reflect Together



Making Your Own Dictionary

Here are some prompts for reflection:

- How did using the strategy of 'Making Your Own Dictionary' help the learning of your pupils?
- Have you noticed any difference in the participation in the activities of all pupils, for example male, female pupils or those who are less confident in their English? If yes, what are the differences?



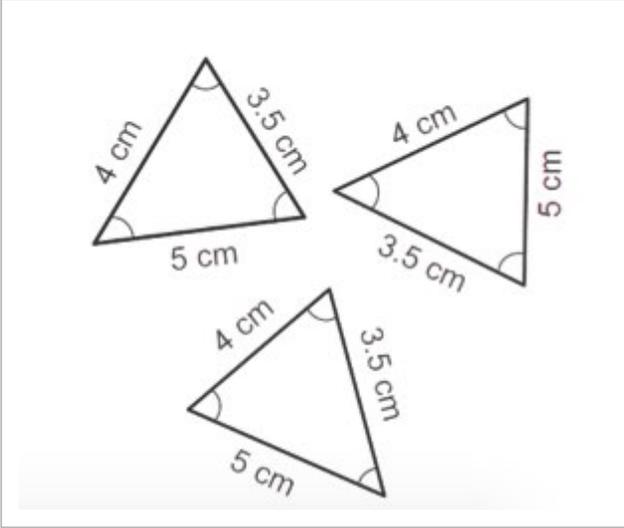
Figure 36. Student teachers discussing terminology in different languages [IMG_3865]

T3-5 M 5 Further Resources

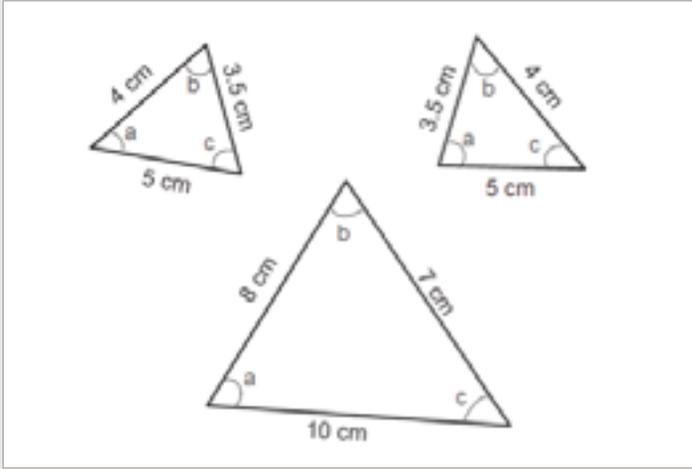


Examples of Entries of a Pupil's Personal Mathematical Dictionary

Entry 1: Congruence in Triangles

Word/concept	Congruence in Triangles
Where?	FDC 122, unit 7 & PFC 222 unit 8
Any meaning in everyday language?	According to the dictionary, 'congruent with' means 'suitable, agreeing', but I have never used that or heard that (The Oxford Dictionary, 1997).
Mathematical explanation from textbook/teacher	Two triangles are congruent if they are 'equal in all respects' that is their shapes and sizes are both the same.
My explanation	Congruent triangles are triangles that are identical in shape and size. Sometimes I have to turn them around or flip them over to actually see this. So the lengths of their sides and the angles will be the same for the congruent triangles. But not only that! Those same length sides and angles have to be in the same place in the triangle – that is what they call 'corresponding'. When you cut out the triangles, you can place them on top of each other and they will be perfect copies. Congruent triangles are at the same time similar triangles, but similar triangles are not always congruent! Also, have a look at my entry for 'similar triangles' to see how these concepts are connected.
Illustration	<p>These triangles are congruent:</p>  <p>The illustration shows three identical triangles arranged in a cluster. Each triangle has three sides labeled with their lengths: 4 cm, 3.5 cm, and 5 cm. The triangles are oriented differently to show they are congruent regardless of rotation or reflection.</p> <p>Figure 37. Triangle Figure 1: congruent triangles</p>

Entry 2: Similarity of Triangles

Word/concept	Similarity of Triangles
Where?	FDC 122, unit 7 & PFC 222 unit 8
Any meaning in everyday language?	Something that is like something else. What makes something like something else is often not made clear.
Mathematical explanation from textbook/teacher	Two triangles are similar, they have to fulfill two conditions: (i) their corresponding angles are equal (ii) their corresponding sides or in the same ratio.
My explanation	Note to myself: do not mix up with congruent! Similar triangles have the same shape but not <i>necessarily</i> the same size. If they do have the same shape and the same size they are similar as well as congruent. So they have to be similar in shape, but not necessarily identical in size. What makes them similar is that the shapes are a proportional enlargement or reduction of each other. If they are the same size then it means the scale factor is 1! That means that the proportion or ratio of all the corresponding sides will be the same (for example, the big triangle has sides twice the size of the first). And that is why these criteria about similarity of triangles make sense.
Illustration	<p>These triangles are similar:</p>  <p>Figure 38. Triangle Figure 2: similar triangles</p>

T3-5 M 6 Sources



Sources for Examples of entries of a pupil's personal mathematical dictionary

TESS-India, *Building mathematical resilience: similarity and congruency in triangles*, http://www.open.edu/openlearnworks/pluginfile.php/134980/mod_resource/content/2/SM05_V2_PDF.pdf, available under Creative Commons Attribution-ShareAlike (<http://creativecommons.org/licenses/by-sa/3.0/>; unless identified otherwise).

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Teaching Strategy 5

Expressing Yourself With New Words in Science

T3-5 S 1 Example



Talk Like an Expert

Teacher Georgina thinks that her pupils will benefit from more practice using correct scientific vocabulary. Now that they are talking more during lessons they sometimes fail to put their point across accurately because of a lack of attention to the details of the words and meanings. Sometimes they say molecule when they mean atom and at other times they mix up the names of processes such as dissolving and melting. Tutor Georgina sets them a task that will help with their scientific language development in the area of elements, mixtures and compounds. The time has come for her pupils to 'Talk Like Experts' in science!

Teacher Georgina's Talk Like an Expert Activity With Pupils

Georgina makes these notes in her activity plan:

- Give out a list of expert words that pupils need to use to describe the separation experiment.
- Model how it is done while the pupils listen and tick off words as they are mentioned.
- Pupils work in pairs to write their own speeches and rehearse how they will 'Talk Like an Expert'.
- Pupils are invited to present to the class with everyone ticking off the words as they use them correctly.

She writes a short paragraph around an experiment her pupils did in their previous lesson to separate iron filings, salt and sand. Here it is:

In order to separate out the element iron from the mixture of iron filings, salt and sand Professor Georgina used a magnet. The iron filings, because they are magnetic, are attracted to the magnet but the salt and sand, which are not magnetic, are not. The next step is to separate these two compounds from each other. Professor Georgina knows that salt dissolves in water but sand does not, so she adds water to the mixture of salt and sand and heats the mixture until all of the ionic compound, salt, dissolves. She now has a mixture of sand and salty water - it is easy to remove the sand now by filtration. But how can she get the salt back? When the salt dissolved in the water the sodium cations and the chloride anions became surrounded by water molecules. Now she must evaporate the water to get the salt back again. All done!

She reads through the paragraph and highlights the words that she wants her pupils to focus on. Here is the list of words she comes up with:

- element
- mixture
- compounds
- dissolves
- ionic
- filtration
- cations
- anions
- molecules
- evaporate

DBE syllabus reference: "Elements, compounds and mixtures" (FDC124, *Integrated Science 2*, Chemistry, Unit 1).

Teacher Georgina describes how she does the activity as follows:

I tell the pupils about the 'Talk Like an Expert' technique and I write the list of expert words on the board. As they are copying the list of words into their books I write the rest of the instructions for the activity where they can all see them. I make sure everyone understands what they have to do and then I begin to read the separation experiment paragraph from my notes. I speak quite slowly and the pupils get to work ticking the words off on their list.

I give them ten minutes to work in pairs and write their own speech using the same words. One group appears to be struggling as they have not written much so I allow them to read through my paragraph for a few minutes and to make some notes. I draw the writing part of the activity to a close and tell the pairs to start rehearsing their speeches.

The volume in the classroom goes up and I remind the pupils to keep the noise down. After a few minutes I ask for volunteers to read out their speeches while the rest of the class tick off the words again. The speeches are all quite different and there appears to be a little confusion over the words *anions* and *cations* (I must address this in a homework) but the exercise is a success and I look forward to better quality discussions from this group in the future.



Figure 39. Filtering a mixture of salty water and sand

Teacher Discussion



Here are some questions to discuss in your groups after you have read through the 'Talk Like an Expert' example:

- Do you think the 'Talk Like an Expert' activity can improve the quality of pupils' scientific language? Does it address the 5 principles for supporting language learning (see introduction)? How?
- Should pupils look up definitions of the words before the task? Why?
- How can you adapt the task for hearing-impaired students?

- Is it important for all the groups to feedback (by reading their speech) to the whole class? Why?
- What other ways can groups feed back at the end of the activity?
- How can you ensure that females and males participate equally in the feedback process?

T3-5 S 2 Plan and Practise Together



Talk Like an Expert

You are now going to plan your own 'Talk Like an Expert' activity. The previous example will only work for you if you happen to be teaching about separating mixtures, so here are some other ideas that you can use the 'Talk Like an Expert' technique with:

JHS

Write a few sentences on atomic structure. Include these words:

- protons
- neutrons
- electrons
- ions
- neutral
- negatively charged
- positively charged
- atom
- sub-atomic particles

Reference: National Syllabus for Integrated Science (Junior High School) JHS 2, Section 1: Diversity of matter, Unit 1, "Elements, compounds and mixtures".

Upper Primary

Use fun ways to support children in learning and using scientific/technical words - get pupils to come up with actions that go with the words to help with remembering them (they could 'act out' their 'Talk Like an Expert' activity).

Write a few sentences on change of state. Include the words:

- freezing
- melting
- boiling

- evaporating
- condensing
- solid
- liquid
- gas

Reference: National Syllabus for Integrated Science (Primary 4-6), Primary 5, Section 4: Energy, Unit 5, "Change of State of Matter".

Lower Primary

Use fun ways to support children in learning and using scientific/technical words - get pupils to come up with actions that go with the words to help with remembering them (they could 'act out' their 'Talk Like an Expert' activity). For example they could draw a circle in the air with their fingers for a circuit, click their fingers for a switch, flick the fingers of one hand for an LED etc.

Write a few sentences on basic electronics. Include the words:

- series
- circuit
- battery
- LED
- switch

Reference: National Syllabus for Natural Science (Primary 1-3) Primary 2, Section 4: Energy, Unit 3, "Basic Electronics".

English

Write a short paragraph on English grammar. Make sure it is easy to understand. It could be a simple sentence with the grammar elements pointed out e.g. In the sentence 'The cat sat on the mat.' the word 'cat' is a common noun, 'sat' is a verb and 'mat' is a concrete noun.

Include words appropriate for the year group you will teach. For example if you will teach primary four, use some of the following words:

- proper noun
- common noun
- adjective
- verb (present tense/past tense/modal)
- adverb
- conjunction
- preposition

Reference: English Language Syllabus 2012, Primary 4, Sections 2: Grammar, Units 1-7.

Maths

You can use the 'Talk Like an Expert' technique in lots of areas of maths as, like many other subjects, it has its own very specific vocabulary. For example, ask pupils to write a short paragraph (in pairs) on how to convert decimals and percentages to fractions using these words:

- divide
- hundred
- hundredths
- simplify
- decimal
- tenths
- multiply
- percent

Pupils use their paragraph to do an activity like the example: They volunteer to read their paragraph out whilst other tick off the words from a list. Do not forget to write your paragraph and read it out to your pupils first before they write theirs.

Reference: Primary Mathematics Syllabus 2012, Unit 5.11, "Decimal Fractions and Percentages".

Planning Your Own Talk Like an Expert Activity

Choose a topic from a lesson you will teach next week that you can use the 'Talk Like an Expert' technique with. It should be something that pupils find challenging at times due to the specific subject language used/needed. Write a short paragraph on the topic and highlight the key vocabulary. Add this to your activity plan along with brief 'Talk Like an Expert' instructions; you can find the activity plan template in the appendix. Also write in your plan other planning details (resources needed etc.) that will help you to do the activity successfully with your pupils.

At the end of the planning activity you should have developed an activity plan that you can use in your teaching in the coming week. Hopefully, you have also considered how to encourage all of your pupils, especially girls, to participate. Make sure you take a little time now to practise the activity that you have planned with your colleagues. You and a colleague might want to arrange to observe each other when you each do the activity with your pupils during the week.



T3-5 S 3 Teach and Observe



It is important for your professional learning that you actually teach the activity that you have planned. Please make sure that you have your activity plan available when you teach. Any issues that arose during the lesson should be written down immediately after you have taught, and remember to fill in your observations section of the activity plan immediately after you have taught. If possible arrange with a colleague to observe each other when you each do the activity with your pupils during the week.

T3-5 S 4 Reflect Together



Talk Like an Expert

Now that you have taught the lesson activity, reflect on how it went. If at all possible, do the reflection together with a colleague who has also tried the activity.

As part of your reflection, consider the following questions:

1. Did you make sure pupils understood the expert words? How?
2. What will you do differently the next time you do the 'Talk Like an Expert' activity?
3. How would you adapt the activity to be suitable for hearing impaired pupils?

Remember to write down your thoughts in your learning journal. Also note down what you learned from this session that was most effective in improving your teaching.

T3-5 S 5 Sources



Image: "Filtering a mixture of salty water and sand". From: Grade 7-9 Natural Sciences workbook, Siyavula textbooks, <http://www.siyavula.com/gr7-9-websites/natural-sciences/gr7/gr7-mm-02.html>, Creative Commons Attribution 3.0.



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Activity Plan

Aspect	Details
Theme	
Teaching strategy	
Student level (year and/or course)	
Syllabus reference	
Specific Objective(s) of the activity	
Activity focus	
Activity description	
Textbook title and pages (if available)	
Materials / resources	
Observations (after lesson)	
Date (written):	Date (taught):

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