An introduction to coding

DEVISED BY
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[with shapes by Susan Ebbels]

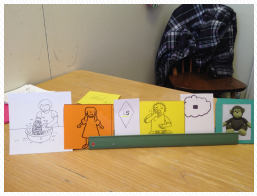
Colourful Semantics

1] A system to support spoken and written language learning across the curriculum, which can be used for –

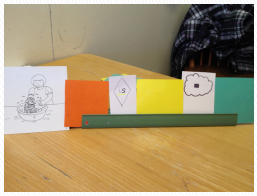
- sentence development
- understanding questions
- understanding written text
- developing vocabulary & learning facts
- developing narrative

2] Aim is to enable teaching staff to use this functionally within the classroom.

4ICW Colours +/– symbols



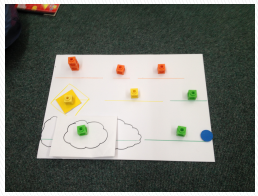
Colours PLUS symbols



Colours MINUS key symbols

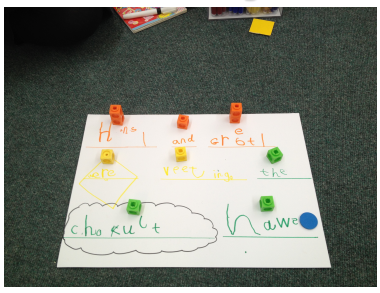
Coding and Literacy : shared writing task

Planning the sentence

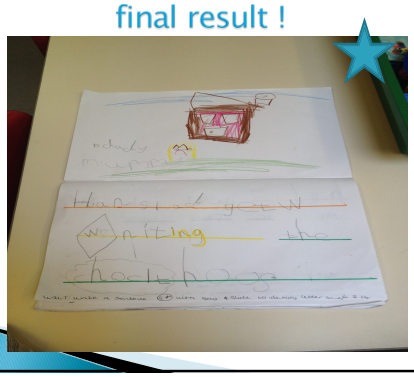


Creating the sentence

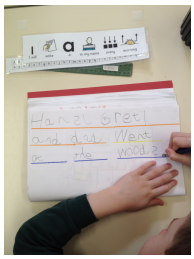
Coding and Literacy : shared writing task



Coding and Literacy : final result !

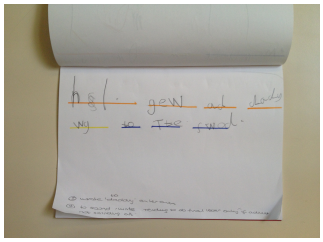


Planning and writing a sentence



No adult support, just lines

Planning and writing a sentence

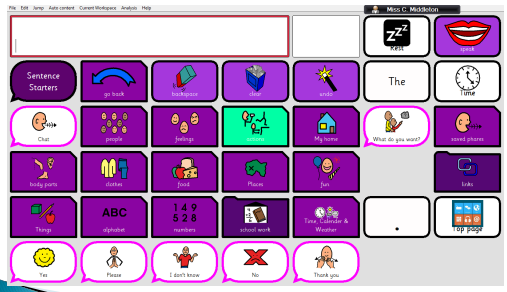


Adult supported writing

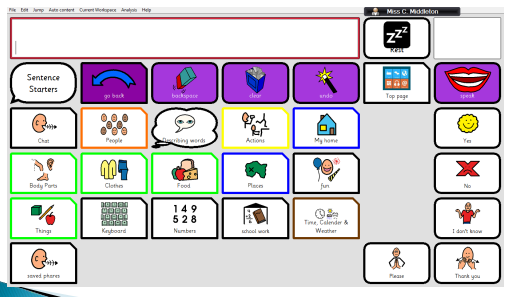
Why colour coding for AAC ?

- Much more obvious visual system for AAC users [screen shots of old v new]
- Immediately gives clues to the sort of meaning the words have and how they can be joined together

SCREEN SHOT – Previous system



SCREEN SHOT– New coding



What is it?

- A highly effective visual way of coding the information in words and sentences. It helps children understand how the meanings of words are linked in sentences.
- Question words are used to link to this meaning. Each question word is designated a colour [or sometimes a shape].

e.g. All words that answer a Who question are orange

The boy is jumping. "Who is jumping?" –>

the boy

Where does coding come from?

- Originally used to help children understand how the meaning of words are linked in sentences. This then helped them make correct sentences when talking.
- This meaning relationship between words dictates how the ideas are arranged in the sentence.
- The key to this meaning relationship is the verb/action word.
- The 'grammar' of the sentence can then change [e.g. verb tense, pronouns] – but the overall meaning of the sentence does not change

We do NOT code everything !

- Tool not a straightjacket !
- Be selective
- You are in control of what is coded
- Do not have to try and code what child says!
- Use it to scaffold what you need

We do NOT fully code everyone !

- Not all children need full coding support for all their sentences
- If the system is throughout the school, all children will pick up the basics, then you can choose who you use it with in more detail
- Can just do additional coding for the area that's relevant for that child / lesson
  eg. Using more cloud words [adjectives]

What happened in Herts?

- Herts had 2 visual systems running

1. Colourful Semantics – Alison Bryan 1997
2. Shape Coding – Susan Ebbels [Moor House School] 2001

BUT both systems from same theoretical base

What's the difference?

- Colourful semantics
  - uses colours only to code the verb & it's arguments
  - Works well with KS1–2 children–?comprehensive enough for some higher sentence level language difficulties
- Shape coding
  - uses shapes to code the verb & argument
  - but also colour to code surface grammar [nouns/ adjectives/prepositions]. ***Some colours different.***
  - also codes surface verb grammar [tense, number] with lines & arrows under the verb phrase
  - Works well for KS2–KS3 , experience shown that many younger children relate to colour better then shapes.

Integrating the 2 systems

- Started to integrate many years ago
- Initially using the non– argument structure shapes [clouds/diamonds] & verb tense arrows with the colour coding system

Incorporating grammar shapes

- We have incorporated some shapes into Colourful Semantics to enable grammar to be coded when targeting these specifically

Theory !

- Bootstrapping
  Chiat (2000)
- Functional [verb] argument structure
  Garrett 1980, Black & Chiat (2003)
  I
- Non-argument structure
  Pinker (1989), Black & Chiat (2003)

Bootstrapping – *CHIAT [2000]*

Syntactic Bootstrapping

- using argument (grammar) structure to work out a verb's focus

Semantic Bootstrapping

- using knowledge of verb meaning in an event to predict the structures it will or will not take

Phonological Bootstrapping

- using intonation/stress patterns to locate verbs/nouns

Argument structure

- All verbs have an argument structure
- Arguments are '*participants in the event*'
  ['who' does *'what'* to *'whom']*
- Expressed as thematic roles
- Obligatory [essential] or optional
- Non arguments

Thematic roles

- ACTOR– Instigator of action.
- THEME – Entity asserted to have a particular state, location or change of state or location.
- LOCATION – corresponds to what or where a theme is.
- SOURCE – corresponds to what it is moving or changing from.
- GOAL – corresponds to what it is moving or changing to.

Garrett Model – updated 1990

- Created from normal 'slips of the tongue' i.e. on line processing errors
- Described 5 levels of representation

1. Message level
2. Functional level
3. Positional level
4. Phonetic level
5. Motor level

Functional Level of Representation

- *Main Level addressed by Colourful Semantics*
- *Planning of **semantic-syntactic relationships***

  *+ **semantic content** via 3 processes*

Processes [& potential problems]

- Lexical selection
- Creation of verb argument structure
- Assignment of the lexical items

"Who-does-what-to whom"

E.G. "*Ben put the apple in the bowl*"

- **Lexical items**

  verb = *put* nouns = *apple, bowl*
- **Argument structure for 'put'**

Verb: actor[WHO] , theme [WHAT], goal [WHERE]
- **Assignment**

  verb: actor, theme, goal

  WHO WHAT WHERE

  [put]: [Ben] [apple] [bowl]

Errors

Lexical selection error

"I cut dinner my fork"

Argument Structure error

"Mum put table"

Assignment error

"Mouse chase cat"

The problem with verbs ! [Chiat 200]

- Rarely occur in isolation
- Less stressed than nouns in word stream
- Poor auditory processing affects **identification & storage of verb phonology**
- Events focusing on verb are brief/transient
- Poor event perception or joint attention affects **identification & storage of verb semantics**

Positional level

- Planning frame created
- **Word order** and **grammatical form** is planned & selected
- **Phonology** for lexical items and grammatical forms found and inserted

"Ben put the apple in the bowl"
"The apple was put there by Ben"
"He is going to put it in the bowl"

We also need to select the semantics for 'Non-argument' structures

- Non argument structures are those not directly related to the verb/verb semantics
- Still adds to semantic content of the sentence

e.g. adjectives/complements , adverbs of time & manner

"The boy is tall"
"Last week I went on holiday"

Colourful Semantics

- Addresses problems in understanding and creating verb argument structure + assignment
- Supports / develops use of 'syntactic bootstrapping' to get to meaning
- Supports poor 'phonological bootstrapping'
- Includes some 'non-argument' structure support
- Shape coding can add some 'morphology' support [e.g. verb tenses, plurals]

The Therapy

AIMS

- To teach recognition of thematic roles via use of question words
- To use this knowledge to understand or create argument structure of verbs
- To assign the right lexical item to each thematic role
- To extend skills to some non arguments
- To use skills as strategy for cuing and self help [spoken & written language]

QUESTION WORDS ARE THE KEY TO CODING

HOW DO WE CODE?

By linking each argument/non argument with

- A **colour/shape**
- A spoken & signed **question** word

For simple sentences

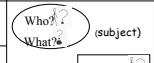
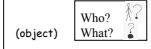
- Associating a target sentence structure with the resulting colour/shape sequence.

Colour coding

- Is it new?
- Language through reading
- Coding grammatical structure v semantic syntactic relationships

Gordon is drawing a picture in his book
v
Gordon is drawing a picture in his book

Basic colour/shape coding :- 'Verb +arguments'

Question Word	Colour Coding	Shape Coding	Thematic Role
(What) Doing ?	yellow		action/verb
Who ?	orange		actor/theme
What ?	green		theme
Where ?	blue		Location goal/source
To Who(m) ?	pink		recipient/ goal

'Non- argument' question words

- ***'What look like'*** – gives descriptive information [e.g. conceptual language of size & colour]
- ***'What feel like'*** – gives descriptive information using conceptual language related to texture, solidity etc
- ***'How feel'*** – gives information about emotions
- ***'When'*** – gives information about time
- ***'How'*** – gives information about the manner of an action
- ***'Why'*** – gives causal information
- '***Whose'*** – gives information on possessives

PLUS

Shape coding also codes grammar words like 'auxillary verbs'

Additional [non argument coding]

Other information	Question	Colour/shape
Adjective / concept *i.e description related to noun*	What like?	
Adverb [time]	When?	Brown
Adverb [manner]	How?	Black
Cause & effect	Why?	Purple arrow
Sentence joining	[Joining up words]	Purple rectangle
Auxiliary Verbs	[Little doing words]	Yellow +
Possessives	Whose?	

BASIC ORDER OF TEACHING

From original paper on GORDON 1998
(see handout)

2-4 ICW – order of teaching for developing spoken sentences

1. Start with verb + 1 argument
   e.g. verb:actor *(DLS person + action)*
2. Increase variety of verbs/nouns
3. Add different argument
   e.g. verb: theme, verb: location
   (DLS 'action+ object', 'action+ place')
4. Increase variety of verbs/nouns
5. Introduce verb +2 arguments. Same vocab
   e.g. verb: actor, theme verb: actor, location
   (DLS person + action + object person + action + place)

2-4 ICW – order of teaching (cont'd)

6. Increase verb and noun variety

7. Contrast with non argument:- 'What like?'

   e.g. " He is eating" v "He is tall"

8. Introduce verb + 3 arguments [e.g. put/give/show]
   e.g. 'give' = verb: actor, theme, recipient
   (DLS = transfer of object to person 4 ICW)
   'put' = verb: actor, theme, location/goal
   (DLS = movement of object to stated place 4 ICW)

Order of teaching (cont'd)

- **But** need to be child led &/or curriculum led
- Generally don't teach arguments in isolation from verb !
- But older child can just focus on problematic isolated role/non argument or sentence type
  e.g. why questions, passives
- Higher level sentence coding will include more non-argument structures

The Instructions

Each time a thematic role is introduced the adult

- **Signs the question word + Asks the question?**

i.e. *actor* :- "Who [+sign] is it?"
verb:- "What is he doing [+ sign doing] ?

- **establishes the colour/shape link**

i.e. "Yes, that's what she's *doing* [+sign]. The *doing* [+sign] words are yellow/oval"

- Continue to emphasise repeatedly throughout activities. Encourage child to express the links

Variables

- In KS1 the key words are generally represented with **symbols**
  e.g Rebus [unless child good at literacy]
- Can progress onto coding just using **coloured lines** once familiar with system
- If you want to focus on two key words in one argument then use 2 symbols/lines but keep colour the same
  [e.g. If working on prepositions then highlight separately i.e. in the chair]

The same words may be used in different roles in sentences

E.G

Bob mended the chair

v

Bob the Builder sat in the chair

REMEMBER…..

Question words
ARE THE KEY TO CODING

- Find the verb and ask the right question to get the answer you want.
- Then choose the colour/shape that goes with that question

COLOURFUL SEMANTIC CODING
How to explain it to others !

What do you already know ?

- Consider these two sentences.

The children gave sweets to the teacher
The teacher gave sweets to the children

The words and grammar are the same but the meaning is different. WHY?

- *The people doing the action has changed*
  i.e. the words that mean 'WHO' is doing the action

What does Colourful Semantics target?

- Now consider these two sentences.

The children gave sweets to the teacher
The children have given some sweets to the teacher

The grammar has changed but the meaning is the same. WHY?

- *The WHO, WHAT and WHO TO of the sentence has not changed*

What does it target?

The **WHO DOES WHAT TO WHOM** of sentences

- By asking questions we can find out the words that go with these and see how the parts of the sentence are linked to give the sentence it's meaning

i.e.
WHO is it? What are they DOING?
WHERE are they? WHAT did they do it to?
WHO did they do it TO?

Supporting Sentence development

- The use of colour and shape coding to support sentence development can be quite complicated.
- Sentence work usually needs to be carried out closely with a SLT.

Colour Coding for Classroom Support

i.e. *We can use coding to*

- Support children saying better sentences
- Support understanding of sentences
- Learn new words
- Record their work
- Do creative writing

EXAMPLE

Using Coding to Learn Vocabulary

An example of the effectiveness was shown by a clinic child who increased their word recall of school vocabulary from 9 to 17 using a coded mind map.

Higher Level Language Group

- Colour coded mind map for 'school' topic
- People = orange
  Activities = yellow
  Objects = green
  Places = blue
- 1 minute to recall as many words as possible
  before = 9
  after = 17