

Gender and inquiry

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What are the key stereotypes about boys, girls and science?

Boys find science easier and more likely to like science. Girls can dislike science.

Boys are **happier about the 'objective' and 'neutral' aspects of science.**

Girls are happier when they can see how science relates to them and to the real world. They like science to include the social aspects.

Boys are happy to 'get on with it' and will easily use equipment.

Girls are happy to write up and want to understand everything.

Topics gendered; boys and car and how it works, girls and health.

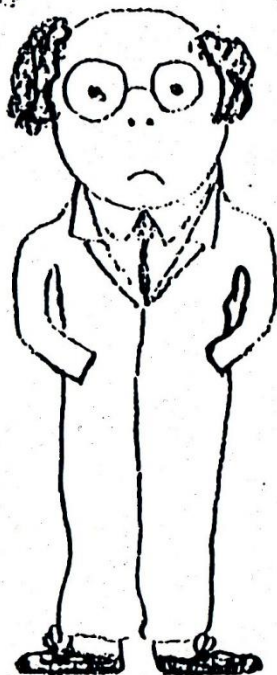
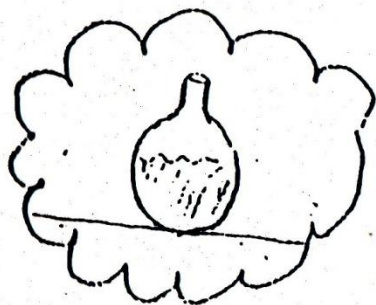
What are the key stereotypes about boys, girls and science?

ROSE report
Institute of Physics



Female Y10

It's a hard choice isn't it !

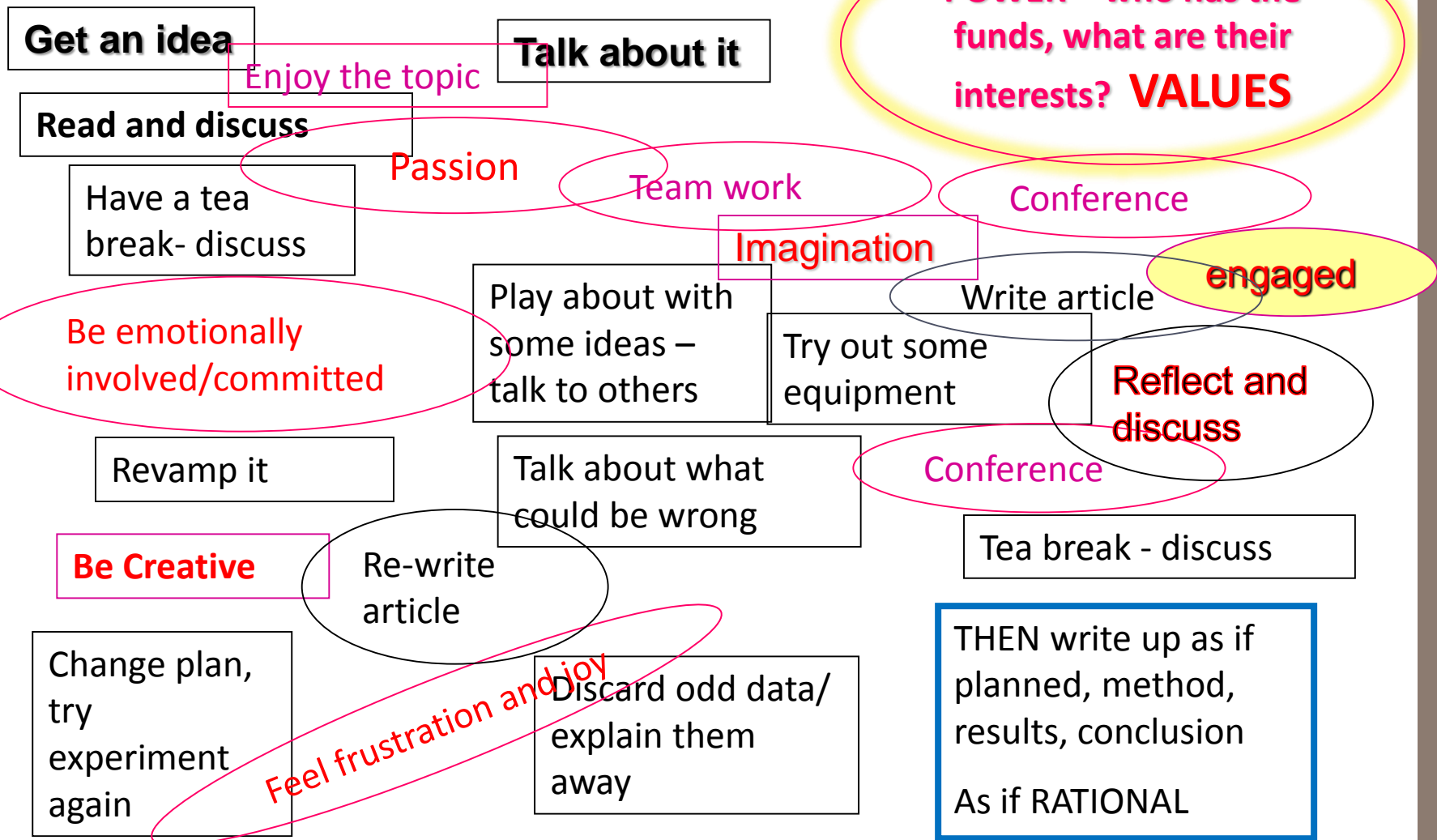




WOW!
INCREDIBLE

Darling
your food has
been on the table
for the last
2 hours.
Eat up!

How do people 'do' science?



Matthews, B. (2015). The Elephant in the room: emotional literacy/intelligence, science education, and gender In D. Corrigan, J. Dillon, R. Gunstone & A. Jones (Eds.), *The Future in Learning Science: What's in it for the learner?* Dordrecht Springer.

How do people 'do' science?

Get an idea

Talk about it

Read and discuss

Have a tea
break- discuss

Be emotionally
involved/committed

Revamp it

Be Creative

Change plan,
try
experiment
again

Feel frustration and joy

Re-write
article

Play about with
some ideas –
talk to others

Talk about what
could be wrong

Discard odd data/
explain them
away

Team work

Imagination

Try out some
equipment

Write article

Reflect and
discuss

Conference

Tea break - discuss

POWER – who has the
funds, what are their
interests? **VALUES**

Conference

engaged

Associated
'masculine'

How can teachers arrange the experiences of the pupils such that they can develop the required skills for enquiry and the associated emotional and social capabilities?

SAILS

That is, less gendered?

Emotions and emotional development should be incorporated (usually ignored). Therefore pedagogy to help.

How to get teachers to change?

Equal opportunities involved.

Notice pupil-pupil interactions. Help pupils develop, accept each other as scientists.

SAILS

Teachers and pupils discuss
teacher/pupil interactions

DISCUSSION ASSESSME

Observer: _____ Class: _____ Date: _____

Name _____ Each time a person talks, put in a ✓.

GUESSES

Class: _____ Date: _____

Fill in the chart below, **without looking at anyone elses'**. Do **not** use ticks or numbers but make a comment like: The most; a lot; the least; frequently; well; not at all.

Name	talking	listening	interrupted others	helped others	how much did they learn?
Yours:					

Other comments (Use the back of the paper as well)

Name:	Class:	Date:	10b
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1. Did you say what you wanted to say? (E.g., All of the time. Most ... Some ... Hardly at all...)

2. Did anything stop you saying what you wanted to?

3. Do you think the others understood what you said to them?

4. How do you know if they understood you or not?

7. Did you argue?
8. How did you settle any argument?

5. After talking, did you change any of your views?

6. How did you **feel** towards other members of the group who held very different views to you?

9. Order of speaking		10. Order of listening and took notice of other's views	
Spoke the most		Listened the most	
Spoke the least		Listened the least	

Classroom Principles

For pupils to develop emotionally they need have time to be involved in collaborative group work so that they are able to:

1. Communicate with each other in a safe environment.
2. Think and reflect on social processes and feelings.
3. Verbalise (through writing and talking) what the interactions meant to them.
4. Compare this with what other people thought had gone on (understand that there are different perceptions of the same discussion).
5. Discuss their perceptions so that they come to understand their own and each other's viewpoints; emotional and cognitive.
6. Learn about each other and to empathise with each other.
7. Learn science and become aware that it involves social and emotional interactions.

In order to encounter a wide range of social and emotional viewpoints mixed ability, multi-ethnic and mixed-sex groups are considered ideal, although this is not always possible.

Below are quotes from teachers about their pupils, when they were in form-tutor groups, who had been taught in ways designed to develop their emotional literacy:

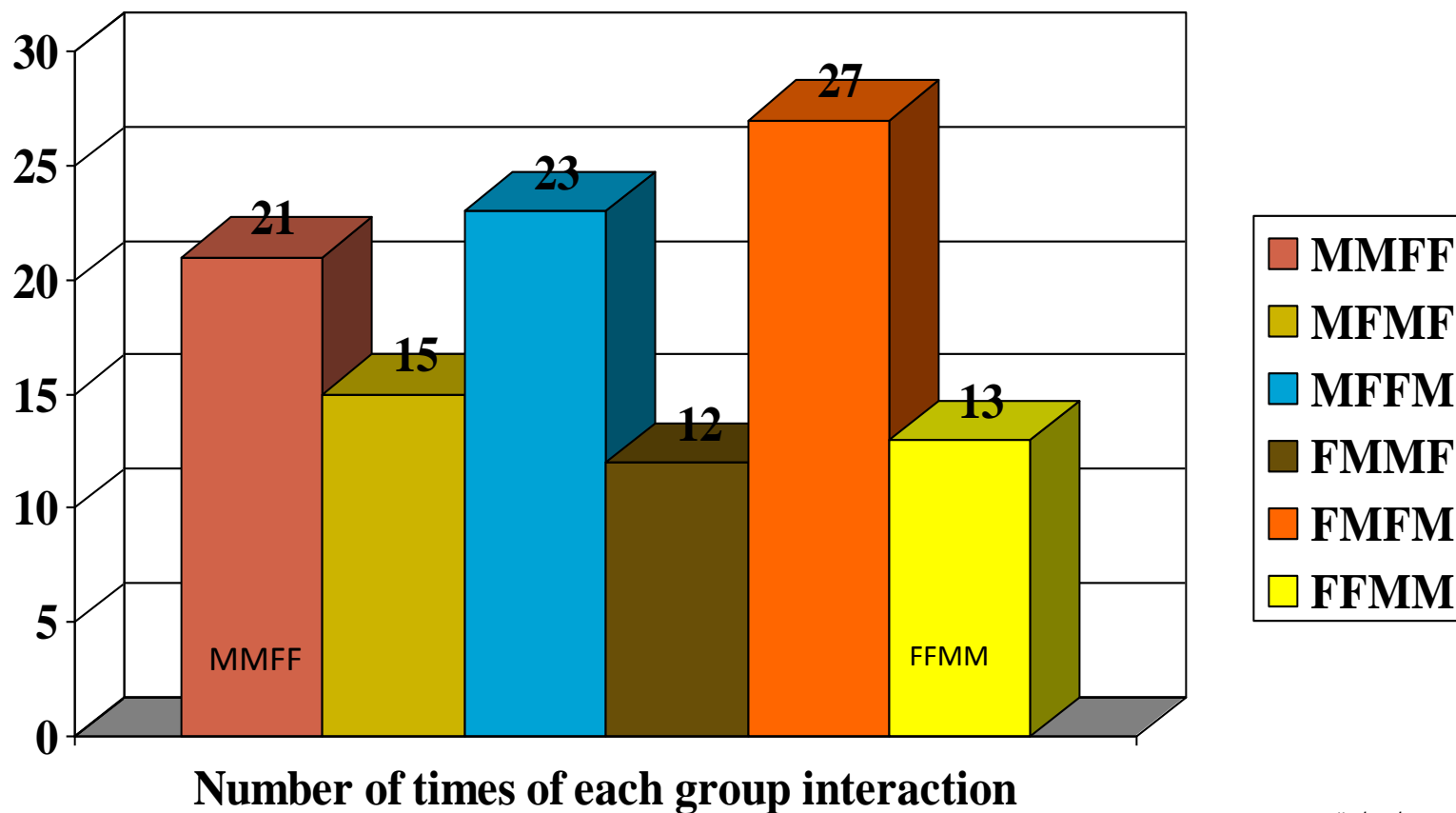
They tended to try to sort out their own problems, or they would come to me and discuss it as group with me, and then because they had this open communication and because they were used to talking to each other we could sort things out much more quickly. It stopped those shouting matches that you get where they are both trying to drown each other out with their point of view because they had learnt the skill to actually listen and then get their point of view across.

Certainly, from what I've seen pastorally, they emotionally support each other. When someone's having a bad day, others rally round, they are caring, very concerned about the well being even of people they don't normally go to or get on with. When one of the boys is upset a lot of the boys are concerned not just the girls so it crosses gender. It's also the same with showing emotions to each other and getting support from each other.

Morrison and Matthews (2006) **How Pupils Can be Helped to Develop Socially and Emotionally in Science Lessons**

Pupils like working together in groups
They enjoy learning to get on with each other.
They enjoy lessons more.
They help each other learn.
They report liking science lesson more and wanting to continue with it.

Brian Matthews (2006) *Engaging Education. Developing emotional literacy, equity and co-education* McGraw-Hill/OUP



talks/grp/gasat-spk

[Group work] makes me feel more interested in science and makes it easier. (Female, white)

Group work has changed my view of science. It has made it appear more socially relevant, less distant and not only about knowledge but imagination as well. (Female, black British)

I think if more group work was done definitely it would make a change in people's view of science. (Female Bengali)

Group work has made science appear social and more relevant, less distant and more about learning. (Male Portuguese)

Yes group work does make it more interesting because you get to hear other peoples' comments and what they are thinking. (Female, Black British)

[Group work] makes science more social, but it does not affect the way I feel about science. (Male, white)

	Percentage indicating that they are likely to continue with science.	
	boys	girls
Research	85%	85%
Control	71%	76%

	Research	At end of year.		At start.	Control	
I prefer to work in a group rather than on my own	6.0	6.1	0.1 boys: 0.1 girls: -0.2	6.4	6.4	0.0 boys: 0.3 girls: -0.4
I prefer to work in a mixed-sex group rather than single-sex	5.8	6.0	0.2 boys: 0.2 girls: 0.2	5.8	5.6	-0.2 boys: -0.1 girls: -0.3
The other sex will like you	4.7	5.0	0.3 # boys: 0.2 girls: 0.5 #	4.9	5.1	0.2 boys: 0.0 girls: 0.4
The other sex will help you learn	4.3	4.9	0.6 * boys: 0.6 # girls: 0.4	4.4	4.4	0.0 boys: -0.2 girls: 0.2

It's made it a lot easier because you mix with different people that you wouldn't usually mix with before, so you get to know them more (g)

I would say that science is a really good subject to do, especially when you're working in groups with other people because you get to know other people and do your practicals (g)
... it's better to work in groups, because you learn more when you work with other people

Science is enjoyable and it's fun when you work with people in groups, you socialise a lot.

... you get different opinions and different ideas for science and what we're doing. And if someone gets stuck you can help them out ... and they can help you out. You just mingle with each other and help each other.

- Matthews, B. (2006). *Engaging Education. Developing Emotional Literacy, Equity and Co-education*. Buckingham: McGraw-Hill/Open University Press.
- Matthews, B. (2015). The Elephant in the room: emotional literacy/intelligence, science education, and gender In D. Corrigan, J. Dillon, R. Gunstone & A. Jones (Eds.), *The Future in Learning Science: What's in it for the learner?* Dordrecht Springer.
- Matthews, B. (2004). Promoting emotional literacy, equity and interest in KS3 science lessons for 11-14 year olds; the 'Improving Science and Emotional Development' project. *International Journal of Science Education*, 26(3), 281-308.

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- Matthews, B. (1996). Drawing Scientists. *Gender and Education*, 8(2), 231-243.