

Lesson 1

This is a transcript of a primary school science lesson. It is the first lesson of a teaching sequence on the topic of forces. Please analyse the transcript by defining classroom episodes. The analysis might consider the following aspects:

- Why does it constitute an episode
- Patterns of discourse
- Communicative approaches
- Presence of dialogic characteristics
- How is it helping to learn science

After the analysis please discuss how it could be used to plan this lesson with the aim of fostering a dialogic teaching practice.

Notation:

Teacher interventions are marked by T: Students interventions are marked by their name (changed for research purposes) or by S# when the student cannot be identified but several interventions can be attributed to him or her. When several students speak at once I have written SS:

T: Right! What we are going to do this afternoon is something that, I am hoping, is going to remind you of things you did further down school. I don't think you did any work on this topic of science in class five, I might be wrong. I think it's probably about as far as year four. And so you might need to really go into the depths of your mind to remember what you did there. We are going to talk about, I'm going to ask you what you remember about what you have previously done. I'm going to ask you some questions about this area of science, and I want you to really just think carefully about what I say to you, think about what I am asking you think about, ask questions if you need to, and just really try to learn from what we are going to say. It is just a review of what we've done so far, at the moment, next week and the week after we are going to do some further work on this, but this is just like an overall review of what we've done so far, to clear things up that might not be clear, clear about in your own understanding. It is also to remind you of what you've done in previous years. Miss (...) might actually have done some of this with you (I don't know what you have been doing on (...)) but I'm not sure what you did. (...) What did you do in science yesterday? {looking at a student} (...) you did, ah?

S1: we did(...)

T: You did so... change and materials, didn't you?

SS: Yeah

T: Yeah, yeah, right. So today I am going to talk about forces. What do you understand by the work force. Any meaning that you can think of. What does the word force mean. Think of other words that might explain what the word force means. {many hands up} Georgie.

Georgie: The word... Push and pull?

T: eee]

Georgie: Like...

T: We'll put it down. I've lost my pen. (...) put my pen... {realises that a pupil is handing her the pen} Oh! {writes in the board "push and pull"} Anything else that might describe what word means, Amy?

Amy: Moves something

T: Pardon?

Amy: Moves something.

T: Moves something? {writes in the board "move something" and pints at the student just in front of her}

S2: Like an, (hold) cause like gravity is a pull force that holds us on the Earth.

T: Let's put a hold {writes "hold". Through out this brief interchange of ideas the teacher uses her body to control interventions, hence when she has heard enough of an explanation she turns around towards the board, signifying the end of the student's turn}. Anything else? If you are thinking of the term, if you are thinking of the word force, then can we use the word force? Not just in Science. Cause it isn't always just used in a scientific way. Ottie.

Ottie: If you like, force something to do, something like... force, like you can force a child to do something.

T: You are using it in the context of the, (staggering)...forcing somebody to do something. How else you might describe that? What other word might you use instead of force there?

Otti: ehh...

T: Courtney

Courtney: Threaten

T:{the teacher drops her arms}}

SS: talk at once]

T: ahhh, uhmmm (chuckles) is not necessarily that, is it? It could amount to that, or it could get to that, but it isn't necessarily that]

Courtney: when you make (...)

T: When you make somebody do something {writes it in the board} make somebody do something, that (...) and do it, which is right when (threat) comes in. Joshua.

Joshua: Action

T: Pardon?

Joshua: Action

T: Actions {writes "actions" on the board}

S3: Movement

T: {Pointing at the second item of the list "move something"} We've got that really.

Mark?

Mark: Power, like force of a hit would have power in it

T: Power is a good word. Anything else that might go with the word power? {as she writes in the board} (...)

S3: Power of the sun?

T: You are using that in context there, aren't you? Another word, (...)

S4: Strong

T: Strong, strength {writes in the board}. Any others?

S5: Speed?

T: ehhhh...let's put (...) {writes it in the board} We might go back to this. Right.

What I'm going to ask you to do next, wear all those in mind, we'll need to (...).

What I'm going to ask you to do next is to get into groups and I am going to tell you who I want you to be in the group with. I am going to tell you where I want you to sit. I will (...) everybody first, and I want you to move to those tables. We are not going to move the tables. We do not need to move the tables because we are going to have four people in the group. In this group here for example you will turn around your chairs and sit there. Ok? People I want to sit in these two tables, or that table there, are... (...) Courtney, where she is?, Ross and Georgie. These people I want you to sit on that, round (Mark's) Hannah, Eleanor, Aidan and George. Ok? These people around here, Mark, Juliette, Billy and Abby. Ah, round Joshua's desk, Loren, Brandon, Cory, Lia and Becky. Round Abby and Page's table, Amy, Lydon, Jess and Lauren. And round Lia's table, and Amy's table, all round this table, (...) Baily, Owen, Page. Ok? Can you move to those tables.

{students move round to the designated tables}

{The second microphone is placed}

T: Right. What I've done here is to photocopy, an entry from our dictionary, (so that everybody) can talk. And there are two, two, two different entries, from different dictionaries, and we are looking at the meaning of the word force. Can you remember (...) a dictionary? The small one, actually has the, thesaurus in with it, and different meanings in the bottom here. Let's look at this one first. The, the meanings are given numbers, according to what sort of meaning the word is

used in, what context the word is used in. So let's look at the first one. If you skimmed down that... copy,...can you see the word now? And then, three four lines down fur, fur, the word fur, so one, two, three, four and five, underneath noun, are the meaning of the word force as a noun. And then, from one down to eight, how it can be used as a verb. Yes? You are all clear about what nouns and verbs are.

SS: Yeah

T: So, the first meaning of the word force, as a noun, is. Look at the words that we've got in here {points at the list in the board} Power, strength, intense effort, the reason I'm giving you this is because I want you to think about all the different ways in which that word is used. And to just help you to understand what that word means. The second use of the word is force when is used as a group of soldiers or policemen as when we talk about police force, yes? You got it used in that, that (...) like the Air Force. The third way: coercion, that's a pretty complicated word, compulsion, to coerce somebody means that you, is really to make somebody to do something word. Is the word to use to (...) that. Four, it can be used as an effect or it can be a significance. And number five, could be using the terms of an influential person, that's somebody who is, who has lots of influence,... (or thing). Don't worry to much if you do not understand some of these or in all contexts. Is important to understand all the different meaning of this word, and then as a verb, again it can be used in a similar way as compulsion, coercion, it can be meant to compel somebody, to compel somebody to do something means that you are making somebody do something (...). The second one, make way, break into or open by force. Think about that, (...) with things. Some of the ways that we use the word. Ah, number three drive or propel, does that fit into any of these {pointing at the list}? just think about it. Impulse(sic) or press upon. Cause of produce by effort, (skipping) through this because a lot of them are quite similar but can be used in different ways. Stray, artificially hasten the maturity, that sounds very complicated, but that is when it is used in the sense of forced vegetable. Forced vegetables are when you, m, make vegetables grow up quicker. Mainly because you want to sell them in the market. yeah? and the last one of this section was, accelerate, or

is accelerate, (...)?{pointing at the list}

S: (...)

T: What did you say which fits in with that?

S: (...)

S2: Speed

T: Speed. And then the next section is telling you how these words can possibly be used in context in which the words are used. We are going to leave that for a minute because I want you to do something else in a minute We'll just have a look at the bottom, section where, the, the (chuckles) I don't usually have problems with this word! The thesaurus section, and look at the different words that can be used instead of force. Skim down that list, read them out to each other in they are upside-down.

{Students read rather silently}

T: And then just have a quick look at the other, photocopied sheet I've given to you, which is quite similar but this one actually uses the word in context, and it talks about the way that the word can make, the meaning of the word, but using it in context. So that helps you to even understand it more clearly as well. So the first one is used as a verb, to force someone to do something means to make them do it. We actually got this one haven't we {pointing at the list on the board}. To force someone means to use violence or great strength to move, push or open it. The use of force is the use of violence, or great strength. We didn't have violence in there, but power and strength.

Courtney: (...)

T: Well yes, well, yeah, yeah, it kind of fits in with that, doesn't it? The force of something is its strength or power. For example, the force of an earthquake can be measured accurately or she saw the force of his argument. A force is a person that has considerable influence or effect. A force is an organised group of soldiers or police. Some of these are the same as (...). A force is an influence that changes a body from a state of rest to one of motion, or changes its rate of motion. And number eight, a rule, a law or a rule that it's enforced, is currently valid and must be obeyed. That is used in context as well, (...)? And it actually tells you the origin of the word. You (...) about etymology before? look to where

words actually originate? so where does it come from, which language does it come from?

S: Latin

T: Latin! From the Latin word *fortis* which means strong. I've given you these, dictionary definitions, because I wanted you to see how many different ways there are of using the word, and how many different meaning there are as well.

T: Let's just go down the list and see what you think. And I am not going to take it any further than that but if we, if some people disagree let's just talk to each other about, what we think about it. And if you, if somebody says I think that's scientific and you had decided that it wasn't, say it, all right? The first one then: The force of the storm did a lot of damage to the building. I want you to]

SS: [

T: Is that not the first one?

SS: no, no is the second one.

T: Sorry, I got, yes: there were so many complaints that the government was forced to give in. If you think that it is scientific or not scientific tell me why?

Ottie: I think not because]

T: You think what?

Ottie: No

T: No

Ottie: Because. like when we did about pushes and pulls (...) is not like anything to push and pull them to give in.

T: That's a good thing that Ottie has done there in her group, and actually I might have mentioned it to one or two other groups. That sometimes is quite useful to be able to put in the idea of pushing and pulling rather than the word force in a sentence. That helps you to think whether it might mean the scientific (...). Sis anybody have anything different there? Second one then. The force of the storm did a lot of damage to the buildings. Amy.

Amy: We think that one is, scientific. Cause it's like a push of the storm, did the damage.

T: Do you agree with that?

Ottie: We got a split decision. They think yes and I think no.

T: You two think

Ottie: Those two think yes

T: You think no, so you disagree with what they are saying.

Ottie:{nods}

T: Can you tell me why?

Ottie: Because it is like, what it is, it is like, that's like the power of the storm, it is the power of the storm that does the push. The power of the storm. Yes the power is.

T: What do you think then?

Courtney: I think it is, because the power]

T:[So you disagree with Ottie?

Courtney: Yes because like the power of the push, yeah is like saying the power of the push did a lot of damage to the building, so it's, cause it would be you, the force that makes, it looks like, ... cause it is the storm. The storm makes, produces something.

T: What do you think? What do you think about what she said there? It was a bit confusing. Aiden

Aiden: I think Courtney is, Courtney is right. We think it is (...) it is the power of the storm

T: Ottie

Ottie: I think it still is, it still is because like, instead of putting like the push of the storm you put the power of the storm, is like in this definition it says, like an earthquake, so, it's like the (...) and i think it is not.

T: Anyone else has something to say?

Mark: Well, mmm, us four agree with Ottie because if you are saying force of the storm did a lot of damage, if you are saying the push did a lot of damage, is like saying the strength of the storm did a lot of damage.

T: It's quite, quite interesting what they are saying here, Jessica you said

Jessica: It's like power and strength (...) just saying that, instead of pushing or pulling it, kind of. I mean, like, power I think it is, like in if you put power in something, you are pushing or pulling something.

T: Is what you are saying there, can you hear what Jessica said there, if you think what she is saying there is relating to, she, what she is saying there is describing the strength of the push? The strength of the push, that she, she... she is looking confused herself. It's possibly the word (...), the word that Oattie is using in here, she is really saying, she is talking about the strength of the push, cause it is a push that does the damage.

S: (...)

T: Do you think? Corrie

Corrie: I think that, m, if someone said (...)

T: What do you think about what she said?

Oattie: I would think it, the, yeah the (air is making a push) yeah, but I think it is more like the strength, cause it, it can related to pushing and all that, but I think the storm is related to that strength]

T: Is it the strength of the push?

Oattie: mmm

T: Let's move one. That's what it seems it's caused a lot of, quite a lot of different ideas from people, but it's good that you are talking to each other and say yes but, yes but. So let's just move into the next one cause (that's just going to give us) something to think about. No one force you to watch that programme.

{Lots of raised hands} Lauren what you think?

Lauren: I don't think it is because, eh, they don't think it is because (it's the lack of, it's not like a force

T: Does anybody disagree with this group? Is there anything there {pointing at the list in the board} that we can put instead of the word force] in that

S: (...)

T: Yes! to make somebody do something. To make somebody do something.

Who was next? {referring to the girls that just comes back from reading practice}

who was next to Mrs Hampman? {addressing the new student and pointing at the last table} Could you sit on the table at the back ,please? You shouldn't

force your opinions down other people's throats? Billy.

Billy: Well, it's like a push, pushing it down your throat.

T: (Chuckling) This is, this really needs some thought, doesn't it? Because I think

this is probably what is meant to mean, but is not literal, is it?

S: Well it's like, it's not, it's not because you wouldn't push your ideas (...)

T: Anybody else think about anything (...) Lyndon?

Lyndon: I agree with, I agree with what Jodie said because, m, a {another student comes in}

T: Who's got Nellie in their group? {gives Nellie directions on where to sit at} Sorry Lyndon.

Lyndon: That was all

T: Just go on

Lyndon: I lost it

T: Lost it, all right. Aiden?

Aiden: You know when, which one we are doing then?

T: Yes, the one about forcing ideas down his throat.

Aiden: Well, it's kind of like a saying, you know, you just say it because you just say that (...)

T: Do you agree with what Amy says? It's more like a phrase, it's more like an expression. {many kids contribute at the same time} An expression, a figure of speech. Sarah wants to enter the Air Force.

Mark: It is like, mmm, the forces (anyway), a force of people. A bit like]

T:[That was the definition we looked at in the dictionary, that of...soldiers or police. {indistinct sound of various voices. Then L points at one group} You think is scientific?

Courtney and co. Yes!

S: Cause it's an air force, it's like an aeroplane.

Courtney:(...) like using force, it involves force

T: Is it pushes and pulls?

Courtney: No, not really, it's more like the speed and the power

T: Is it pushes and pulls then?

Courtney: no]

T: Is it scientific then, you think? Anybody else said anything back to them? Aiden

Aiden: (...) Someone wants to join the air force, it is like a force, but it's not like a pushes and pulls force

T: ok.

S: (...) It is just a name or something

T: do you think?

SS: Yeah.

S: I think that, (...) you are not going to force the air to do something(...)

T: You are not going to force the air to do something.

SS: {laugh and talk at the same time}

T: We are getting into things that are a little bit a little too detail, I would think, really. Ah, mmm, is food for thought is that, but it is just a title. Let's move on to the next one

T: I think that listening to the groups as you've been discussing this, some people has come up with some really good ideas, First of all, I do not want to go into too much of the detail, really, about what, what you've said here, because everybody has had their own ideas but the people that (...) some very good ideas, and again you've discussed things with each other and said: no, I do not think that's happening, I think this is happening. And that's really good. I just want you to think about this, cause we are going to finish in a moment, some people were describing the power, this is the word they used, the power, when we were talking about the cricket, cricket activity, and the power of the hit, and Billy, who's not here at the moment, was saying that, you know, the power of the hit was making it go further... What that brings up, is something to do with.. the strength of the force? the strength of the push? in that case. Do you agree with that?

S: yeah]

T: Cause if you only hit a little bit it wouldn't go as far, if you hit it real hard, it would go further. I think that's fairly common knowledge, and people understands that that's the case, cause you've all done that. So, the strength of the push, the strength of the force, is something quite important when we are talking about science. Because science has to be, we have to look at things, we have to be able to measure things. And sometimes it's important to be able to measure the strength of the force. yes? Does everybody agree with that? ... Do you know what we do measure?

SS: {softly} yeah

T: forces with? (...) Think! Have you measure any forces when you've been working on forces before? Lyndon.

Lyndon: Like, they measure Newtons, which are like a pull of forces

T: Go on, tell us....What's a Newton?

Lyndon: Like a weight. Like a weight that weights pull, push forces.

T: {other kids chuckle}Ah, Lyndon is being brave enough to say what he thinks, why are you laughing girls? go on Lyndon

Lyndon: Like in Newtons, measures like a pull force, lie the weight of a pull. The weight of something.

T: Can anybody say anything else about that?

Mark: Is it like, the Newton is like eh, a bit like the gram, or a bit of (...)

T: Anybody else?

Courtney: It measures, it measures, like the power of , like the power of the push really. Like you know like when you hold on to the (...) pull it back (...)]

T: You know what a Newton is?

Courtney: Well, I think is...] (quite small)

T: [Anybody else?

S: Is it something of a scale? and ah, inside (...)

T: You are talking about a piece of equipment, a Newton-meter, sometimes they are called the force meters, that's what you are all talking about, isn't is Carrie?

Ottie: Is it when you measure the, the, like a force, something like an object on

T: So, can you tell me what a Newton is?

Ottie: Is it, erg, the size of the push

Mark: While all the Newton-meters it measures, it measures the force

T: It does, it's the unit of measurement {places her hands as if she was measuring a distance}, isn't it? It's the unit of measurement. It's the way in which we can measure the strength of the push or the pull. And if you, have you used force-meters before?

SS: Yeah, n, YEAH

T: No, yes, no

SS: {students all talk at once}

T: {she produces a newton/meter }

SS: Yes, that's it {all talk at the same time}}

T: [Right, we might, we might go on to your (...), we'll go onto some of these because I want everybody to be familiar with this. This scale inside is showing the units, and this is bringing (...) remember. We are going to use this, this is a force-meter. Its measuring in newtons, so we can measure the strength of the force, of the push. The other thing that I need you to consider here, when you were wondering what is going on in some of these playground activities that we were doing outside is what? What else, what else you might need to consider when we are thinking about forces? The strength of the force, what else we might need to consider, so that we can describe what we are seeing? Amy

Amy: The length?

T: The length of the force. What do you mean by that?

Amy: It's the way, the length it took to hit on something. Or like the length it took (...)]

T: [Length is a measurement of distance.

Amy: Time length.

T: Time is a measurement of distance. You might need to measure, depends on the activity, I am just talking about the forces themselves, what other thing we might need to consider when we are talking about forces themselves?

Lyndon: The amount of it?

T: Is that not the strength?

Lyndon: Like, like, like pushing something, it might just be a little about (...) pushing out and then could be a lot of it pushing out, like, like not just, not the power of it, like, like the amount of]

T: It might depend on the activity, mightn't it?

Mark: Does Lyndon means like {he turns towards Lyndon} do you mean like, do you mean like the amount of strength?

Lyndon: mm

Courtney: that's the power of the push

Lyndon: no, I mean like the amount of, like say if you have wind it might be just a little bit of wind that's really strong and then the amount of like, the amount of

wind, like lots of wind that is just as strong as (...)

T: I know what you are saying, yes? But I want you to just think more in general terms about what we might think about forces that might happen in different situations, in any of the situations that we've talked about. You are just thinking about a particular context, I think there, aren't you? ... yeah

Ottie: would some (...) be like, like, most of it(...) like the air, think of the air, the power of the air (...)

T: Aaaaa, again that might have something to do , depends on what you are thinking about here. Are you listening to me? {to a group of distracted kids}

Ottie: like with the (hover) of the air (...)

T: Some of you, some of you have actually indicated on your drawings what I am trying to get at here? ... some of you have actually showed it on your drawings. What I, are we talking about? Look at your drawings... What else, how else are you trying to explain these forces?

Mark: Is it telling eh, telling you, telling how the forces, ...how the forces work?

T: Mmmm, I don't really know what you mean by that?

Mark: Like how, how, like how forces, like how forces work.

T: eeeeeeee, mm, could be.

Ottie: Like how you , how you make the force.

T: That could be as well. It is just not, not the one thing I am trying to get from you. All, all of the diagrams I've seen they are actually showing what I am trying to (...), what else have you got on your diagrams? ... How have you tried to explain these forces on your diagrams?

S: Arrows, arrows.

T: And what's that explaining?

S: Which way

T: Which way! which way the forces are working! What's a better word to use?

S: direction

T: The direction! of the forces. Is that important?

SS: yeah

T: Is it?

SS: yes

Mark: cause it's like, if you put it in a certain direction, it's like a certain push and a certain pull

T: The direction of the forces is important. The direction is important. The strength of the force is important, the direction of the force is important. Right, we've done a lot of work today.