My name is David Pearson. It’s good to be here in NSW again and today we are going to talk about a subject that is near to my heart: how we can use reading, writing and language to support inquiry-based science.

I’ve been working on a project on this over the last several years and I’ve learnt a lot about how the impact and the synergies that you can develop between science and literacy if you use this approach.

I want to address three questions. The first is how integrated instruction benefits both science (and here I mean acquiring knowledge and inquiry skill) and also benefits literacy (oral language as well as reading and writing). And secondly, I want to talk about the synergies between learning literacy and learning science. And lastly, I really want to focus on how we can use text to play a supportive rather than a supplanting role when we teach science.

Our motivation for doing this is the absolutely awful reputation that text has when it comes to teaching science. If you talk to people in science education, which I often do, they'll tell you that text is the enemy; that text eclipses students' involvement with inquiry science and instead of going out and investigating the world, kids just read about other people doing it. They'll tell you that texts promote a view of science a declaration of fact rather than an exploration of the natural world. Again, you know, eclipsing that notion of investigation and inquiry.

They'll tell you that trade textbooks, or trade texts rather, you know for kids and the like, frequently include misinformation and thus they promote misconceptions on the part of young children in particular. They’ll text you that text promotes a notion of science as the memorisation of a lot of words, just long lists of vocabulary.
Someone did a survey of secondary school biology texts and figured out that there were more words in that secondary school biology text than there were in an entire year of a foreign language.

And finally that sometimes the texts are so hard that they drive teachers into a stance where instead of having kids read the text, they read it for them or they tell them what they would have gotten out of the text if they had actually read it.

So text has had a pretty bad reputation in science education and, you know, I want to try to eradicate that bad reputation; and one to do that is to use this integrated approach where we use reading, writing and language to support inquiry-based science. And why an integrated approach? Well, first of all, because there are natural limits to both reading and to discovery-learning in just everyday experience in learning science.

There are some things in the world that are too far, too big, too little, too dangerous or too far away for us to investigate things firsthand, so text is really our only motivation: the solar system, for example, or the bottom of the ocean or the atomic structure of matter.

Secondly, reading, writing and language are authentic to the practice of science. If you go talk to an everyday practising scientist, what you will discover is that they use reading and writing all the time. They read other people’s work, they take notes, they have journals, they write reports for others to read. It’s not a foreign activity for scientists.

Thirdly, reading and writing are best situated in the curriculum when they are used as tools to help you discover something else. I like to think of reading and writing as tools, not goals and I think they are best used when they are helping you acquire knowledge in science, social studies or literature for example.

For us there is this awful congested curriculum that we have in at least in the (United) States, I don’t know if you have it here in Australia, but there is so much pressure to teach math and literacy well, that there is barely any time left in the curriculum for science and social studies, let alone art and music. And then finally, and I suppose the most important reason for integration, is that in our work we’ve discovered that there is a lot of mutual benefit to the effort that is that kids do in fact learn literacy and science better when they are integrated.

The driving question in all this work is: Can we integrate reading, writing and language into inquiry-based science without all of the collateral damage of typical literacy-driven efforts that we have seen in the past? And our approach, as we have said, is that we lead with the science and our goal is to teach science in the most efficacious way we can and the means for doing that, as I have indicated too, is that using reading, writing and language as the tools for teaching the acquisition of knowledge and skill in science.
Driving question

- Can we integrate reading, writing and language into inquiry-based science without all of the collateral damage of typical literacy-driven efforts?

Approach:
- lead with the science
- use reading, writing and language as tools, not goals.

So what we like to think of as the typical separation or segregation into silos of science and literacy ought to be eradicated and we ought to bring them together in an integrated approach.

The strategy for doing this is that we took an inquiry-based science program that we had at the Lawrence Hall of Science at the University of California, Berkeley, where I work, called Great Explorations in Math and Science, and what we did is that we integrated reading, writing and language into that science curriculum. We got money for it from the National Science Foundation and we’ve also been supported very generously by foundations, like the Noyce and the Gates Foundation.

It’s a classic R and D (research and development) cycle. What we do is we do a long period of design work where we design these units and we figure out, we try them out in our classrooms, we have literacy educator, a science educator and the classroom teacher and we sort of smoke-test the units; they find out what does and doesn’t work; they re-design it and then we come back to the drawing-board and we do it again. And then we take things out for field-tests and typically we’ll have somewhere between 60 and 100 teachers from around the country who will volunteer to use the units in their classrooms and they try them out and they give us feedback and they tell us what does and doesn’t work. And then and only then after we revise our units of work on the basis of that work, is we participate in a randomised control trial where we test our program against a business-as-usual approach which is typically where science and literacy are completely compartmentalised.

We have a huge team (- I’ll just flash it up here so that you can see the members of the team) as you can see there are 10 or 12 literacy educators and 10 or 12 science educators. It takes that many people to produce the kind of work that we are producing.
Our entire seeds and roots team:

**Literacy**
- Gina Cervetti
- Jen Tilson
- Alison Billman
- Megan Goss
- Carly Stoff
- Elizabeth Shafer
- Jill Castek
- Marco Bravo
- Sara Hernandez
- Jennifer King Chen

**Science**
- Jacqueline Barber
- Suzanna Loper
- Jonathan Curley
- Justin Baker
- John Erickson
- Kevin Beals
- Catherine Halversen
- Lynn Barakos
- Ashley Chase
- Lincoln Bergman

We have so far produced 12 integrated units: four in Grades 2 and 3, four in Grades 3 and 4, four in Grades 4 and 5. And the reason that we have a span in grade level is that in the US, you can never quite figure out where particular content units fit in the science curriculum. Sometimes it might be second grade, sometimes it might be third grade. But we have tried to span these grade levels for exactly that reason.

12 integrated units

Grades 2—3
- Soil habitats
- Shoreline science
- Designing mixtures
- Gravity and magnetism

Grades 3—4
- Variation and adaptation
- Digestion and body systems
- Weather and water
- Light energy

Grades 4—5
- Aquatic ecosystems
- Plants and moons
- Models of matter
- Chemical changes

We want to develop the units in Grades 6 through 8 and also it’s my dream to take it down to K and 1 because I think that it’s going to be a real interesting challenge. We gotten a grant to do this 6 through 8 work from the Gates Foundation and we’ve just started that about three or four months ago and we’ve applied for funding to do K–1. But right now we are just have the 2 through 5 and the research that I’m going to talk about today and the units are from that work in Grades 2 through 5.

The Future

Just started 6-8 this spring with a grant from the Gates Foundation

Still waiting for a US Federal grant to fund the K-1 work.

Our theory of action is that we have input which is the integrated literacy in science approach. We have a set of design work which is what you call ‘proximal outcomes’ and this is really the teaching, these are things like oral language practices like vocabulary, like comprehension and the inquiry strategies in science. There are what you call in research lingo ‘proximal outcomes’ and ‘proximal’ from ‘proximate’ meaning ‘near’. We also have what we call intermediate outcomes and these are learning outcomes. This is what kids learn about reading, writing, language and science.
And then we have what’s called ‘distal outcomes’ and ‘distal’ from the word ‘distant’ meaning these are the transfer measures that we hope down the road that kids get better at. We’re not doing this program so that kids can learn the content of our units, we’re doing the program so that they become better at science and literacy on texts and tasks and content that they have never seen before. So those are the real ambitious goals: the distal outcomes or transfer measures. That’s really the heart of this work.

Each of our units is either four or eight weeks in length; we have one science book per week; we have one reference book that is the kind of thing that a scientist would use like the handbook of the elements, the handbook of chemistry and the like. We have a materials kit and we have student investigation notebook and then, of course, because we are doing research and because it’s in schools, we have assessments for every unit too to measure how much science and literacy the kids have acquired in the units.

Here’s a shot of the various books in the Year 1 unit. This called Shoreline Science and we have books that serve different purposes and I’ll talk about those in a moment. But the reason that we have so many books is that we really want to promote kids’ reading in the context of learning to become a good scientist. And why books? Because they can be engaging, because reading is an authentic activity and because these books have real world relevance; they really talk about the content that the kids are supposed to acquire in this unit.

The bottom line in this work, and I’m going to cut to the chase right now and tell you what the results are, is that this approach works much better than a compartmentalised approach where you have
literacy over here and science over here. When we put them together, we have much better effects. I’m just going to show you a few numbers now so you’re convinced that this really works.

Here’s what we call ‘effect sizes’ and this is sort of the average difference between the integrated and the content comparable separated unit. We get what we call small to moderate effect sizes in the statistical lingo. And what that means is that these are differences that you can trust and write home about as these are worth sitting up and taking notice of. And we get them on vocabulary, we get them on science knowledge, we get them on reading comprehension and we also get them on writing.

<table>
<thead>
<tr>
<th>Grades 2-3: Shoreline</th>
<th>Key Vocabulary</th>
<th>Science Knowledge</th>
<th>Reading Comprehension</th>
<th>Writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grades 3-4: Light and energy</td>
<td>.22</td>
<td>.65</td>
<td>***</td>
<td>4.5</td>
</tr>
<tr>
<td>ELL: Grades 4-5</td>
<td>.85</td>
<td>.83</td>
<td>.55</td>
<td>**</td>
</tr>
</tbody>
</table>

Notes:
1 Random assignment to treatment
* Not an outcome but much uptake of vocabulary in everyday assignments
** Not yet analysed
*** In re-analysis

The writing results are just fantastic. I want to show you one slide with some more data. I want you to look at these charts. What’s on these charts is a comparison of the experimental and the control group. And remember that the experimental group is what we call the Seeds of Science Roots of Reading which is the NSF program we developed and the control group is the business-as-usual comparison control group where you doing reading in one part of the day and you do science in another part of the day.

As you can see in terms of the features of writing, like the use of evidence, and the strength of the interjection, the overall clarity of the argument and the strength of the conclusion in a piece of writing we have kids do, you get huge effects favouring experimental feedback. So something good is going on in these approaches and we’re really pleased with that.

What we try to do in this approach is that we capitalise on natural synergies between science and literacy. So, for example, there’s first-hand investigation in science, but when you read about other people doing things, you can be doing second-hand investigation. You have conceptual knowledge in science and you have vocabulary in literacy; you have inquiry in science and you have comprehension in literacy; you have the discourse of the domain, that is, how people talk about material science and how people talk about biology in science and then you have what we call ‘scientific registers’ in literacy.
And what we’re trying to do is show that what happens on one side of the equation helps what happens on the other side. That when you’re doing first-hand investigations, it helps you get better at reading about other people doing it. But when you’re reading about other people doing investigations, it actually helps you with your own first-hand investigations. So this is all about the synergy between science and literacy.

The first synergy is between text and experience. What we try to do is to engage students in both first-hand and second-hand investigations to make sense of the natural world and I like to show this little relationship that the one supports the other and you can see in that fancy animated slide that I just showed you.

And we have found that texts can serve important roles in inquiry science; texts can provide a context for reading. So, for example, in the Shoreline Science unit, we have a book called *Beach Postcards* which is a story about a girl who goes on a trip with her parents and at every beach she visits (and I want to know what kind of parents she has if she has a lot of beaches that she can visit), she sends a postcard of that beach to a friend back home and talks about the kind of sand on the beach and things like that. And that sets the kids up for a unit on what they are going to learn about and what the forces are that cause sand to take form it takes and the like so it really serves a purpose but it sets a real world context for that investigation.

Texts can also support first-hand experiences. In the same unit on Shoreline Science called *Gary's Sand Journal* which is a book from a real, practising sand scientist who teaches at the University of California, Santa Cruz, and it’s all about his sand investigations and the like. And in it are lots and lots of pictures of sand and it really shows kids the composition and the shape and sand that leads back into their investigation again of the forces that shape what sand makes it the way that it is.
Texts can also provide models. We have a book called *Shoreline Scientist* which is a model of how a scientist works. We also have a book called *My Sea Otter Report* which I love because it models a kid actually doing a scientific report and it goes back and forth between the boy in the story (he’s the main character) and he hasn’t the foggiest notion of how to do a report, but he knows someone who does know how to do a report and that’s his fifth-grade sister. So he goes to her and she’s the model for how he is to do this report. And it’s just a delightful way of telling a story about doing a report in a way that kids will relate to and it actually does end up modelling a good model of how to do a report.

We also use texts to provide second-hand experiences with data. You might be out doing some investigations with sand, but you are also going to read about other people doing investigations with sand. And you’re going to do the same thing that real scientists do: you’re going to compare your results with other scientists. And that’s the idea of building on the work of others is an important attribute of scientific inquiry and we try to model that by using first- and second-hand investigations. All of the books promote content, that is, that they have content that is just there for the learning and the like.

So those are the five roles that texts can play in inquiry science and you, know, there are the same role that texts play for scientists. Scientists read to situate their research: that is, providing context. Scientists read to learn about the findings of others: that’s content. Scientists replicate others experiments and procedures: that’s modelling. Scientists read others’ data and findings: that’s supporting second-hand investigations and scientists use reference works to conduct their own experiments and the like.

So, it’s not like these approaches to using texts that we’re advocating are so off base, they’re really the same kinds of things that scientists use in their everyday work.
The second synergy is between concepts and vocabulary. The question there is there any real difference between concepts development in science and development vocabulary in reading. And we like to think that there isn’t. The reason that there isn’t is that words aren’t the point of words, ideas are. We don’t words so you know that words, we teach words so we have a label for an idea that you can carry around in your head.

We think if you can teach for conceptual knowledge, vocabulary acquisition will be the outcome, that is, that words will be the residue of good teaching and good learning.

We also insist on repetition and use in all the contexts when we read text, when we write text, when we talk. Our mantra in Seeds and Roots is: read it, write it, talk it, do it. Do it, read it, write it, talk it in any combination whatever you do in the one mode supports what you’re going to do in the other modes. And over time, we want to make sure that kids encounter new vocabulary, new concepts in all those modes so that they come to own the words and can actually use them in their talk and in their writing.

We teach words in conceptual networks. So let’s say we’re focusing on the development of the concept of habitat. We show how habitats are actually related to a lot of the other concepts that the kids are learning about. Organisms live in habitats, right? And also, those organisms have adaptations, behaviours and structural adaptations, you know, their body parts and the like that enable them to live in that habitat. For example, a root is a kind of a structural adaptation of a plant that has evolved over the years so that plants can get the nutrients that they need and the like. And of course, the roots are in the soil and in the soil are decomposers and these decomposers break down living matter in the soil to provide the nutrients that the plants need to survive and the like.
So you can see how all these different concepts are related to one another and what we actually do when we teach vocabulary is we teach vocabulary for this evolving conceptual network of concepts that you’re acquiring while you are learning.

Words are labels, then if you will, for the concepts and ideas. Excellent vocabulary development is nearly indistinguishable from excellent concept development and learning the academic language of science means forming rich conceptual networks of words.

Here’s a model of how we think about words in our season with this program. Take a word like *habitat*. You can deal with habitat at a recognition level where you recognise the word and can say it, you can deal with *habitat* at the definitional level, and by the way, one of the things that we’ve discovered about definitions is that they’re not bad. The problem with definitions is that they’re a kind of a summary of everything we know about a word, but they are just the tip of the iceberg. What really matters is what’s underneath that definition, what supports it.

We also deal with words at the relationship level. How does this word *habitat* relate to all the other important words that are going to support its development and the like? We also understand that kids need to deal with words in a contextual setting. That is, they need to see a word used in different contexts in both text and oral language. And, by the way, one of the things we know from research on vocabulary is that you need to see a word in five or six different contexts before you can grasp the boundaries of things in the world to which that word applies. If you just see it in one context then you don’t really know that word and you certainly don’t own that word.
We also know that it's important for kids to use words while they're applying the concepts that the words are the labels for. And this is what's so great about inquiry-based science is that we have kids engaged in first-hand activity and when they use the verbal while they're doing something, you form a really strong bond between the label and the idea. And that's something for me as a literacy educator that I've really come to understand is how important the doing is in the acquisition of a concept and in kids' retention of those concepts.

And finally, we also know that we need to use these same words when kids are synthesising their words about a topic. And for me, the real discovery is that (you see everything that is shaded in there?) those are the aspects of vocabulary development that we really want to promote.

Now what this means is that for every unit, we have a target, a core set of concepts and the associated vocabulary and we want to develop the concepts and the vocabulary at the same time. I put up one set of words here (shaded in green): light, ray, reflect, transmit, absorb, block, refract and emit. This one set of words in a unit on light. Now let me show you another set of words (and these are in a kind of orangish colour): material, interact, source and characteristic. What's the difference between these two sets of words? The first set of light, ray, reflect and so forth are unit-specific words and these are the sorts of words that you would only encounter on a unit on light. But look at material, interact, source and characteristic, those are words that you'd encounter in science, right? But these are what we tend to call 'academic words', that is, they stretch across many academic settings. So these words are useful in just about any science activity and you could probably also find them in Social Studies, right? And maybe in literature but maybe not.

So it's important to distinguish between these two kinds of words and both are really important.

The third synergy is between comprehension strategies in reading and inquiry strategies in science and I like to say that they reinforce one another. In bolder settings, I say that they're virtually isomorphic to one another; you can't tell the difference between them.
Comprehension and inquiry are the accepted meaning-making strategies in reading and science respectively. They share the same goals. What they both involve is making sense on the basis of experience. The source of the experience is different in science than it is in reading, but they’re both about rendering that crazy world we see sensible.

These synergies are particularly evident when we ask students to develop arguments and explanations for things that they read about or things that they observe in the world. And that’s really the source of this discovery about their synergy and isomorphism.

We talk about five (strategies): activating prior knowledge, establishing purpose and setting goals, making and reviewing predictions, drawing inferences and conclusions, and recognising relationships amongst ideas. To develop our curriculum, we sat and said “Okay, what are the kinds of questions that we would ask if we were using each of those strategies and then, what’s an example in science and what’s an example in literacy?”

And what we find is that they really do reinforce one another. So, in a unit, if we do making predictions as a reading activity, we also do making predictions as a science activity (as an inquiry activity). So what you learn when you’re dealing with the books reinforces what you learn when dealing with first-hand experience.
What is the role of language in science?

Science is all about language, but language is more than words. Science is a discourse involving ways of talking, writing and being. Learning science includes learning the ways that scientists describe, explain, predict, synthesise and argue. Ways of communicating in science are different from those of everyday life.

Synergy 4: Science is a discourse

Astronomy is not just the sun, moon and stars; it is a way of talking about the sun, moon and stars. (Paul Goodman, early 1970s.)

We also find that there’s an interesting role for language and science. Science is a discourse. It truly is. Without the discourse, there isn’t any science. Without the language, there is any science. But language is more than words. Science is a discourse involving ways of talking, writing and being and sorts of ways of taking a stance towards the world.

Learning science includes the ways that scientists describe, explain, predict, synthesise and argue. All of that is about the discourse of science. It’s a way of communicating and the way of communicating in science is different from the way of communicating in everyday life. When we talk science, we are not talking everyday life and everyday experience.

Paul Goodman making years ago had this great quote: Astronomy is not just the sun, moon and stars; it is a way of talking about the sun, moon and stars. Okay? And I think that’s an important distinction because without the language, there is no astronomy.

So, we think it’s important to teach the scientific terminology head-on and to teach the register of science and instead of avoiding the language of science, we embrace it. We use scientific terminology in investigating, discussing and writing about science because that’s what scientists do. We learn the language of argumentation and what we do, as I indicated earlier, is that, every time we have an opportunity, we bind the language to activity. That’s the real key in the whole thing, that is, the read it, write it, talk it, do it piece.

Teaching the language of science

Instead of avoiding scientific terminology and register in classrooms, we embrace it. Use science terminology in investigating, discussing and writing about science because this is what scientists actually do. Learning the language of argumentation. Bind language to the activity.

One of the things that you may be asking as you hear this presentation is that where is the literacy instruction? Well, I assure it’s there and it’s there in three ways. One is just as in literacy we have a lot of explicit instruction in our approach. We have a lot of repeated opportunities for practice and our goal over time in literacy is to gradually release, over the course of a unit, the responsibility to kids for reading, writing and talking.
So, here you have that model of the gradual release of responsibility that I have used for so many years and we know that, with any luck, over time that as kids get better at any given skill or activity or learn more about a particular knowledge base, that they'll do more of the work and we do less of the work. But we also know that we're always prepared to slide up and down that gradual release of responsibility diagonal because kids don't always work in the space that we want them to work in so we have to be prepared to be more helpful to some than others and be more helpful at some times than others.

We also in vocabulary development, as I've said, we have the domain-specific vocabulary. Here in this example that I'm showing you now, this is a unit on designing mixtures, so words like **dissolve**, **soluble** and **substance** would be domain-specific vocabulary and then we have words like **evidence**, **observe** and **compare**. Those are science inquiry vocabulary and they're also words that we’d call academic vocabulary because you might even find them in Social Studies or other subjects, certainly Social Studies and Mathematics.

In reading comprehension, as I’ve indicated, we read and make sense of science books and we use very specific comprehension strategies: activating prior knowledge, posing questions, making inferences, connections and predictions and the like. And then we also spend a lot of time helping kids discover the features of non-fiction texts, like what do you do with the table contents, what do the headings mean, what do the captions mean, how can you use them to help you understand the content better.
Then in oral and written discourse, we have a lot of writing stuff. We use non-fiction genre, note-taking, scientific explanations, reports, summaries, procedures and we do a lot with visual displays, using diagrams and labels and concepts maps of the key ideas within a unit and the like. So, a lot with those kinds of written language stuff. We also have a lot in oral language and we encourage the kids to develop the tools of scientific argumentation: What’s your claim? Why did you think that? What is your evidence? You agree and you disagree with others because ... and the like.

And we have a feature we call ‘discourse circles’ where we put kids together and the rule in the discourse circle is that you have to talk science. You can’t say guess, you have to say predict. You can’t say think, you have to say hypothesise and the like and we do that intentionally so that kids have an opportunity to uptake the language of science.

So the bottom line in all this is that has not been an easy journey. It’s been difficult. We have a lot of work left to do, but it’s well worth the effort. We find that when we engage in this integrated approach that we get improved reading, improved writing, improved vocabulary and, of course, improved science knowledge and that’s really the biggest pay-off.
We also find that the effects for those kids who are most at-risk: English language learners, low achievers and the like, our effects are even more intense for them. We get increased efficacy for students and increased efficacy for teachers. One of the side benefits to this program is that we find that is teachers, many elementary teachers, primary-grade teachers in particular are very reluctant to do inquiry-based science because they don’t feel competent and confident about their science knowledge and we find that, as a side benefit, that teachers often increase their science knowledge when they teach these units.

So we’ve learnt how to use reading, writing and language to support science in a curriculum that appears to be as good for literacy as it is for science learning. Knowledge fuels literacy and literacy knowledge. That is what we’ve discovered so far.

I’ve tried to depict in the slide that you’re looking at now, I don’t know if you have this in Australia. In the Great Plains in the United States, we have these big silos for storing corn and grain and the like. And I like to think of our curriculum as a silo, that is Mathematics is over here, Science is here, Social Studies is here and the Language Arts is here. And what we really need to do is to change that view.

We need to think of reading, writing and language as tools that help you acquire the knowledge and inquiry skills in Science, Social Studies, Mathematics and Literature.
And, yes, I think that Literature is better viewed as a discipline than it as exclusively a language phenomenon and what I like to do is depict these as a matrix or better yet, and you see this attempt on my part to use a weaving metaphor rather than a matrix as a way of depicting how reading, writing and language can be interwoven with Maths, Science, Social Studies and Literature.

I don’t like my own drawing, so I found a picture here of a loom and I think if you think of the content areas as the warp and reading, writing and language as the weft you can see a nice metaphor of how those might be integrated.

Well, I guess another way of putting it and this is my most popular article ever. It’s a 150 word piece and in the Sunday New York Times Sunday March 28, 2006 and it was when we had No Child Left Behind was very popular in the (United) States and the idea was No Child Left Behind was privileging reading and maths and it was driving Science and Social Studies off the curricular stage and my warning was if we don’t realign the current curricular imbalances, Science and Social Studies may surely suffer by ultimately reading and writing will suffer because reading and writing and not about reading and writing in general.

They’re not these generic things; they are reading and writing particular texts that are grounded in particular experiences and they both depend upon the existence, the acquisition and the utilisation of knowledge. That was what the comprehension revolution in the 70s and 80s was all about. It’s not about knowledge in general, it about knowledge of particular disciplines, domains of inquiry, topics, patterns, concepts and facts.

In short, the very stuff of subject-matter curriculum. So as literacy educator, I’m all for making reading, writing and language tools to support other kinds of goals. So here’s my way of supporting, easing the tension between science and literacy. Literacy has been heating up the school day. It
has literally become a curricular bully and literacy doesn’t have to put Science off the curricular stage; it could become a curricular buddy which I’ve tried to depict in that picture. And all it takes to move from being a bully to a buddy is a very small orthographic and phonological shift – you just have to change two letters.

I want to thank you for spending time with me today and I wish you well in your work, in your classrooms and your schools with your children whose futures have been given over to your responsibility and efforts.

Reading list:


