# Wondering Aloud

by Carla Foster

*Presenting the Montessori tools of the Great Lessons highlights the power of storytelling in teaching. Carla Foster suggests that children should be aware of how their learning increases as wonder points them to the mystery of the unknown. Engaging in the dialect of wonder during presentations can bring participants to attention by suggesting that "all the world is a stage" and they each have roles to play. She implores educators to go deeply with their children through sustained conversations of curiosity that will lead to gained social skills, equal participation, and building public speaking skills.*

From Plato's Phaedrus:

> Socrates is having a conversation with his young pupil, Phaedrus, under a plane-tree, by the banks of the Ilissus. Following a discussion of what forms of rhetoric and writing are pleasing to the gods, Socrates relates a myth. The myth involves an Egyptian king, Thamus, and Theuth (Thoth), the god of writing, who brings the gift of letters to human beings.
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> Thoth is describing the gift of letters: "These O king," said he, "will render the Egyptians wiser, and increase their powers of memory. For this invention may be regarded as the medicine of memory and wisdom."

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> "Oh most learned Theuth," replied Thamus, "It happens that you, who are the father of letters, through the benevolence of your disposition, have affirmed just the contrary of what letters are able to effect. For letters, causing the memory to be neglected, will produce forgetfulness in the mind of the learner. Men, trusting to the external marks of writing, will not exercise the internal powers of recollection. You have not discovered the medicine of memory, but only of reminiscence. You will likewise deliver to your disciples an opinion of wisdom, and not truth. They will be readers of many things and will have learned nothing; they will appear to be omniscient and will generally know nothing; they will be tiresome company, having the show of wisdom without the reality."

Socrates states that written instructions for an art cannot yield clear or certain results but rather can only remind those that already know what the writing is about. Furthermore, writings are silent; they cannot speak, answer questions, or come to their own defense.

The ancient Greeks used the term *dialectic* (from Greek: *dia 'through' + legein 'speak')* to refer to various methods of reasoning and discussion used to discover the truth of things. And it is dialectic: living, breathing, human to human discourse that Socrates considers to be the better method:

> The dialectician chooses a proper soul and plants and sows within it discourse accompanied by knowledge—discourse capable of helping itself as well as the man who planted it, discourse which is not barren but produces a seed from which more discourse grows in the character of others. Such discourse makes the seed forever immortal and renders the man who has it happy as any human being can be.

This story has two aspects that I would like to consider more carefully. One is that writing is only an aid to reminding, not memory, and the other is the importance of the conversation, of wondering aloud.

We have a Great Story of Communication in Signs where we initiate the children into thinking of the alphabet as an important part of the story we tell about ourselves. Just as the children coming into the elementary have a largely Linnaean view of nature: that all plants and animals existing today have always existed, they also have

a "Linnaean" view of writing, that all the words they see around them, the books and the signs, have always existed. Our story tells them a tale of work, invention, migration and communication. It is a wonder tale and needs to be told in that fashion. This story is pure propaganda in the truest sense of the word: *congregatio de propaganda fide "congregation for propagation of the faith."* It is important propaganda and we must have the faith of Thoth in the value of the alphabet in order to help the children desire to unlock its mysteries.

> She did not negate the importance of memorization but wished to truly pair it with inspiration. Let us think of what it really means to know something "by heart." The magic of ***knowing*** does not come by constantly referring to a text.

We also have another material, the Hand Timeline, which places the Story of Communication in Signs in a chronological context. Writing, as a special activity of the hand, happens in the small strip at the end of the black timeline. The only other image is the hand with its stone tool. Although the story emphasizes what human beings were doing with their hands, it also brings in another element: Human beings passed on their knowledge through story and song, through conversation, and through oral traditions. Storytelling is one of the oldest forms of cultural transmission. Oral storytelling, including drama, song, poetry, and demonstrations of techniques, is embedded as a learning strategy in the brain.

For the elementary child, this has special significance:

- Oral storytelling puts language at the center of communication: Words must be tasted and heard, not just seen, for the child to develop the joy of language. We must hear language to be able to use language to build pictures in the mind. Oral language is the foundation of literacy and yet can also stand on its own as a medium of the transmission of knowledge and culture.
- Oral stories bring people together in a community. Sitting alone, each of us with our book, separates us.
- Stories are remembered better than lists of facts.

But let us take one step away from oral storytelling and think more deeply about what lies at the heart of being able to tell stories: the ability to memorize. Now although Montessori says,

> Our aim is not merely to make the child understand, or still less to memorize, but so to touch the imagination and enthuse him to his innermost core. (*To Educate the Human Potential* 11)

She did not mean to throw the baby out with the bath water. She did not negate the importance of memorization but wished to truly pair it with inspiration. Let us think of what it really means to know something "by heart." The magic of *knowing* does not come by constantly referring to a text. Gandalf would not be nearly so impressive if he had to Google his spells on his smart phone before he cast them. Anyone who does a play with their class may recognize this phenomenon: Every year our class would do a play, and inevitably some child would get sick right before the premiere. If I asked if anyone knew the lines and could take over, many hands flew in the air as the children yelled, " I'll do it. I know all the words." In doing a play, to know one part, you need to know most of the other people's parts as well. The power of that kind of learning by heart is often underrated. Amazing things happen to children when they realize that power within them.

Now let us think about another thing that can be memorized: math facts. In the primary, we introduce the writing of the combinations of math facts at the same time as the children are learning them. This works because of the power of the absorbent mind. The children have lots of time to write, and their muscle memory is probably helping them learn the facts. However, this is a process that often does not work in the elementary and may keep the children, as King Thamos asserted, from actually learning their tables by heart, keeping the knowledge on the paper and not in the mind.

In the elementary, we have to make the children conscious of what memorization is and how it can be accomplished most effectively. One thing that really helps is verse. Poetry sets up a system of order and harmony. Rhythm and rhyme are logical structures that a child comprehends even before he or she understands the words themselves. Reciting poetry aloud, hearing and tasting the words, sounds, and

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rhythmic patterns awaken the mind. Other memorization techniques do similar things. None of them use pure repetition. All of them are about making connections and looking for patterns.

With regards to fluency in math and reading, it is important to help the children become aware of patterns as well as using repetition. This means oral games. No writing. This is the most difficult aspect for teachers to accept, that there will be activity with no discernible written product. But to crave that product may hinder the natural process of memorization. Some children do feel that they learn by writing things down and that strategy should be offered to them. However, it should always be emphasized that learning by heart is a kind of knowing that is carried around everywhere, light as a feather, not some heavy tome called "Things I have learned in school."

Here is a "game" to play that pairs repetition and pattern recognition for learning spelling. Take any list of words from the environment that the children are interested in. The key is being sure they are *interested in.* These might be words about volcanoes, countries, geometry, dinosaurs, or whatever. Some should be long and some should be short. They should contain some of the spelling

variations that exist in English (or any other nonphonetic language). The group can be of mixed level and age because the children do not need to be fluent readers.

- Norway
- Sweden
- Portugal
- Lichtenstein
- Germany
- Slovakia
- France
- Lithuania
- Estonia
- England
- Scotland
- Denmark
- Iceland

Clap the syllables of each word and sort them by the number of syllables.

| 1 syllable | 2 syllables | 3 syllables | 4 syllables | 5 syllables |
|---|---|---|---|---|
| France | Norway | Germany | Slovakia | Lithuania |
| | Sweden | Lichtenstein | Estonia | |
| | Denmark | Portugal | | |
| | Iceland | | | |
| | Scotland | | | |
| | England | | | |

The "game" or conversation consists of investigating relationships. The first question to ask is:

- Is there any correspondence between the length of the word (number of letters) and the number of claps (syllables)? If there were, then the language would probably be completely phonetic. There is not, and this may be very surprising to children, as they usually correlate the two in their minds.

- Then go through the list of vowels in English: Is there any correspondence between the number of vowels and the number of claps? Here we begin to see a correspondence in many cases. So maybe there is a general rule.

- Now look at each clap and how many vowels are in it. If there is more than one, what can we say about them? (One is either silent, or we have a diphthong.) Some vowels in English are silent, and some get together to make one sound. Let's pay attention to that.

- Then look at each clap and how many consonants. Here the children can identify phonograms and consonant blends.

We then sum up with the children what we have discovered. There does seem to be a general correspondence between the number of vowels and the number of syllables, with some exceptions. Some vowels are silent and some are engaged in cooperative ventures to make a sound. We may also discuss some of the interesting aspects of vowel sounds: The same vowel letter can have several sounds! Consonants also have cooperative ventures, and some get together to make one sound and some just blend but keep their own sounds. Consonants also have sound variations that we need to pay attention to.

Now we do not want to leap to any conclusions. Maybe that was only that particular list. Maybe there are more things to think about. We end this lesson with the challenge to the children to look at more words in this way, looking for patterns that may help them learn standard spelling.

With elementary children, it is not enough just to make the children conscious of the world and the great inventions of math and language; we must also make them conscious of the workings of their own minds: the how and why of how they are a human being who thinks. We need to make them aware of what it means to memorize and know something by heart. It is not sufficient to observe with the eyes; one must engage the child in conversation.

> Wondering is about being frank about how small we are and how big the universe is.... Our sense of wonder allows us to appreciate the extraordinary, the unique, and the surprising.

A 10-year-old boy is working diligently on 3-digit by 3-digit multiplication in the abstract. He is not making up his own problems but using printed cards with problems. At first glance he seems to be working well, concentrating, undistracted by the other work going on around him. A check-list approach would categorize him as working independently and mastering this process in the abstract.

I decide to ask him about this work, how it is significant to him. "Do you mind if I ask you about this work?" "No, he replied." "What are you working on?" "I am doing some math."

"I see you are doing long multiplication. What are you working on?" He clearly does not understand the question. "I am supposed to do some math."

"You seem to know how to do this kind of multiplication in your head. Are you working for speed and efficiency?"He gives me a blank look. "Speed would mean that you can do a lot of problems in a short period of time. Efficiency would mean that your mind goes to the answers right away without a lot of effort and that you know the steps of the process by heart." Another blank look.

"Would you like me to time you to find out your average speed?" "Sure." "Maybe you should also challenge yourself by making up your own problems." "Then I wouldn't want to put in numbers with seven, because I do not know my sevens tables very well yet." "Well that is good for you to know about yourself. Let's find out your speed without sevens then."

So he made up some problems and I timed him. He realized that, without sevens, he could do a 3-digit by 3-digit problem in about a minute or so. We had a little conversation about what that might mean: He had a pretty automatic recall of the process and automatic recall of most of his facts. And what did that mean?

"If you didn't do some multiplication like this for a couple of weeks, and did other types of math instead, do you think you would have the same time?"

He wasn't sure, so he decided to do an experiment with that. He also decided to work on his sevens tables with a friend so that he wouldn't be afraid to put sevens into his problems. We discussed the sevens table, and it turned out that there were just a few of those combinations that he felt were a problem. We talked then about the process of memorization.

Later I heard that this same boy came more eagerly to math lessons and got especially excited about the patterns he could see in squaring, cubing, and the powers of numbers. There was a transformation in attitude as the boy began to see math as a voyage of discovery. And he learned all his times tables by heart as well

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because he understood the importance of having them as quickly accessible as tools of the mind. And he communicated with other children about what he had discovered about math and the process of learning it.

If we view memorization as a necessary evil in our classrooms, we will be denigrating its importance for the self-construction of the human being. We think and solve problems with what we have in our working memory, which includes recall of memorized information. Memorization trains the mind to pay attention and focus intensely and helps the brain to recognize patterns that may facilitate future learning. Knowing something very well can be a springboard for using the strategies that knowledge provides to approach an unfamiliar set of problems.

Let us also remember that *vocabulary* is also stored as memorized knowledge. And it is a nuanced and precise vocabulary that allows us to engage in meaningful conversations and explorations of the world. Armed with words and an imagination, we are prepared to wonder aloud.

**Wonder–is not precisely Knowing**

Wonder–is not precisely Knowing

And not precisely Knowing not–

A beautiful but bleak condition

He has not lived who has not felt–

Suspense- is his mature Sister–

Whether Adult Delight is Pain

Or of itself a new misgiving–

This is the Gnat that mangles men–(Emily Dickinson)

If memorization helps us feel secure with knowing, wondering helps us feel the excitement of exploring the unknown. This is why we have to reconsider what we call our "lessons" if we are truly to

use them to help the child develop the reasoning mind. What helps the reasoning mind to develop? The question. Wondering is about the question mark. Is it true? Is it really true? Is it always true? If so, why? If not, why not?

When we wonder we entertain possibility.

> The important thing is not to stop questioning. Curiosity has its own reason for existing. (Albert Einstein)

Wondering is about being frank about how small we are and how big the universe is. We don't even know exactly where the word *wonder* comes from. We trace it back to Germanic *Wunder* and then the trail grows cold. But the word has a number of facets: curiosity, admiration or marvel, and doubt.

Our sense of wonder allows us to appreciate the extraordinary, the unique, and the surprising. Wondering aloud together with others helps us manage anxiety. To be left alone with our questions about life, the universe, and everything can throw many children into catastrophic "what if" scenarios. Wondering together arms us with the courage to face the unknown.

Mario Montessori wrote in 1956, "To what can they attach themselves, our unlucky children?"

And Maria Montessori answers:

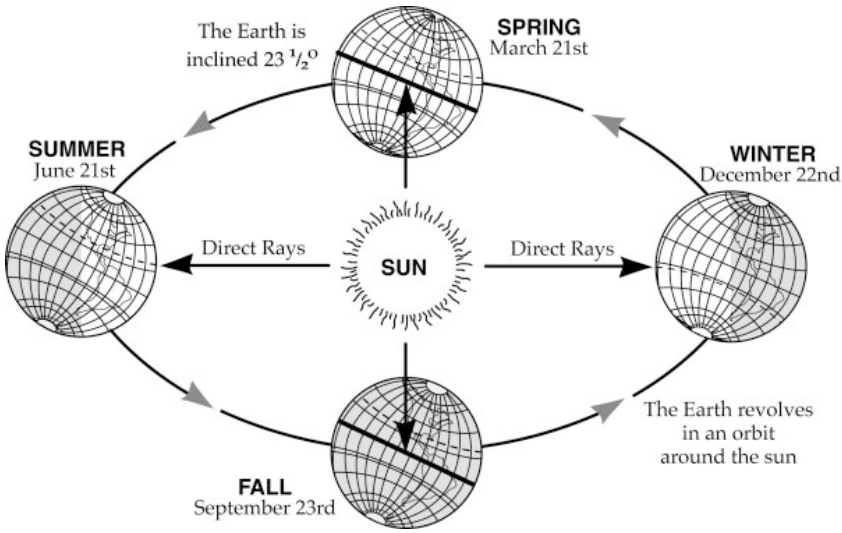
> There is a syllabus which can give an understanding of the conditions of man in modern society with a cosmic vision of history and the evolution of human life. What purpose would education serve in our days unless it helped man to a knowledge of the environment to which he has to adapt himself. (*The Formation of Man* 11)

If the world is our stage, and we are the actors living out our cosmic task, then we must ask many questions about our stage and our story in order to play our part well.

- What is the creation? What is the scenery that we move about in? This is the world, the geography, the plants, and animals.

- What has happened before our appearance on the stage? This is the history of the world.
- What is the nature of human beings? What are our characteristics, our gifts? What do we bring to the play? How is each of us unique?
- What relationships do we create and maintain with our surroundings and each other?
- How can each individual move the story of our planet forward, create history? What work has been done by human beings?

It is these kinds of questions that help us to initiate the children into learning as a conversation with the world and their inheritance as human beings. Does the world speak to us? It speaks to us through its phenomena. We must interpret it with our language. Our stories of the world need to challenge the imagination and sharpen the children's ability to observe and to reason, and then continue to pose questions to spark exploration. One important relationship to explore and understand is the relationship of the Sun and the Earth:



When the child comes into the elementary at six, the children maybe have seen such a chart in a book. They may have been told that the Earth orbits around the Sun. But what do they know from their own experience? They know the Sun rises and sets and shines during the day. If they are in Norway they know they get to play outside much longer in the summer than in the winter and that in order to sleep in the summer it may be necessary to have black blinds to cover the windows. As human beings, they are functioning in a prescientific sensorial reality. Moving them from this "truth" of things to a scientific "truth" is the path of guided reenactment that our lessons must provide. We need to take them through several thousand years of human inquiry in just a short time. However, we cannot do it by simply explaining or giving information. Building up a scientific understanding requires many stories and presentations, using models and dramatization. It requires showing, not telling.

Many of us have charts to act as aids to the imagination. Some are very impressionistic, others more factual. If we do not have such charts, we borrow them from books. But many of us fall into the trap of using these charts didactically while using the phrase "This chart shows you." But what does the child actually see on the chart? Four circles (not spheres) and a smaller "Sun" and lots of lines. Think about what kind of background knowledge is necessary to really understand what that factual chart "shows":

- Does the child really understand that each of these circles is actually a three-dimensional sphere?
- Does the child really understand that the four "earths" are one Earth at four different times of a year?
- Does the child have any background knowledge to understand what 23 ½ means?
- Does the child know the sequence of months of the year?
- Does the child know what direct rays are?
- Does the child understand that the light and dark areas are because of the Sun?

- Does the child have any background knowledge to interpret all the lines that are drawn on the earths?

- Can the child imagine that the "fall" earth is "closer" to him and the "spring" earth is on the other side of the Sun?

- What does the child know that would help them to correct the misunderstanding that spring and fall should be warmer than summer and winter because the Earth is closer to the Sun?

Our presentations break down the enormity of this relationship and its consequences into the individual phenomena that can be demonstrated. Without physical demonstrations, the child does not have a different empirical knowledge base than that of the evidence of the senses.

Does our heritage as human beings speak to us as well? It can, through our stories and through our materials. The elementary materials must speak to the children through the way we converse about them as we present. If we present them only as mechanical means to solve a problem, they become didactic teaching props rather than the aids to the imagination that they are. To fully engage the children in the use of the materials, we need to do a guided reenactment and recreate the process by which humans walked the walk towards abstraction without needing tens or hundreds or thousands of years to do so.

What principles govern the kind of conversation we are looking for? It is not casual conversation, chatting about whatever comes to the surface mind. It is a conversation with a purpose. However, it must also honor and extend what is already shared and known. This is why we must largely present to small groups, to pool the collective resources of the children. It is why the groups can be of mixed ages and mixed levels, where every individual contributes what they have and takes what they need.

Another purpose of the conversation of the presentation is to map the process aloud to create the narrative story of the activity.

As a narrative, the presentation has a beginning, a middle, and a resolution. It has main characters who have roles to play. The role of the multiplicand is to be the type of bar taken out of the box in the checkerboard and other multiplication activities. The role of the multiplier is not to be a physical entity but is a command: how many times the multiplicand should be taken out of the box. This language of the activity of multiplication must be verbalized, "Let us take 3 four times out of the box." If we do this consistently, then we can challenge the reasoning mind to build on this solid foundation when we want them to take 3, one fourth time out of the box, or 3, negative 4 times.

We change the language of *take* to *keep* and keep one fourth of each unit on the mat. We reason that a negative multiplier might mean "to put back in the box" and we create a situation where that can be done. (Lay out pairs of positive and negative bars that equal zero and then put back the positives.)

> The world is full of magic things, patiently waiting for our senses to grow sharper. (Yeats)

If we are going to use the conversational model in our presentations, we must not only be very aware of the language we have to use to keep the conversation on a purposeful track, we must also be aware of how each child in the presentation needs to participate rather than just observe.

Sometimes this involves modeling how a presentation has several roles that can be divided among the participants. In working on the checkerboard, there are several roles. One child may be in charge of taking the appropriate bead bars out of the box. This might involve the simple act: take 5 three times out of the box; or the act of thinking: if 5 taken three times is 15, how does 15 look? A one and a five. Two children might be then laying out the bead bars making sure that 15 tens is placed with the 5 bar on the tens square and the one in the hundreds square. One child might be recording, either the final answer or the partial products. One child might be double-checking the answers to each small multiplication on a finger chart. The adult role is to keep the focus on the category of multiplications: tens times tens makes hundreds. Without that

aspect, the checkerboard becomes a mechanical trick. The division of labor modeled in this presentation is an important strategy for the children to practice with the adult present, so that when they work on their own, they will have a strategy for success.

There are other strategies one can use to increase participation and make the most out of the conversation that is happening. One thing that many teachers struggle with in groups is that one or two children "take over" while others remain passive. One habit that teachers have which exacerbates and perpetuates this, is asking a question that they know the answer to, having the children raise their hands, and then allowing only one to answer.

To increase participation and engage the children in putting their heads together, teachers can use the following prompts:

- "You may only get one turn with the material, but if you watch and think carefully, you can take all the turns in your head!"
- "When I ask about something, I will give some thinking time. Then I will count to 3 and anyone who thinks they know the answer can say it out loud."
- "When I ask about something, if you think you know the answer, put one finger in the air."
- "I will say the answer. If you agree with me, point your thumb upwards. If you disagree, point your thumb downwards."
- "Is there anyone who thinks they know the answer? Let's use the material to prove whether we are right or wrong. If we are right, great, if we are wrong, no problem. The material helps us to find the exact answer so that we don't have to guess. (This may also be done by writing down the answer one thinks we will end up with.)
- "If you would like help with the answer, you may ask others for suggestions."

- Each person can whisper what they think will be the answer to their neighbor. The neighbor confirms whether or not they agree.

These suggestions and strategies help the students with social skills they need for successful group work. The most active may not be allowed to control the group's time all the time. The shyer children must be encouraged to be more active. It is important for all the children to learn to observe carefully and not always be up front with their ideas.

There are fundamental truths that Cosmic Education conveys to children:

- As soon as humans had hands to work with they used them to create.

- As soon as humans had minds to think with they started to wonder.

- As soon as humans had language to speak with they began to tell stories of the past, present, and future.

- They explored the world. They observed the world. They named the world. They sang about the world. They classified the world. They measured the world. They saw its patterns, its law and order, and they told stories about that too.

- They adapted. And they began to transform the world. The stories became the stories of their own lives and were passed down through generations through stories in song, stories in traditions, stories in objects. And each human group thought their story was the most important and perhaps the only story.

- But the world they were describing was not the whole world. And to know the whole world is certainly impossible. Now the stories are too numerous, too ever changing. Still, there are things we can know

about the way the world works and the way that we work as human beings.

Let us make sure that there are truths they know by heart that give them the trust in themselves to continue to wonder. Let us make sure that we are allowing the children to walk that necessary walk towards deeper understanding of the essential principles of how the world works. Let us make sure that our elementary classrooms are alive with the conversations that would make Socrates (and Montessori) proud.

> The pursuit of truth and beauty is a sphere of activity in which we are permitted to remain children all our lives. (Albert Einstein)

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