# Re-inventing

# Literacy

# Education

## using

**Words**
**in**
**Color**

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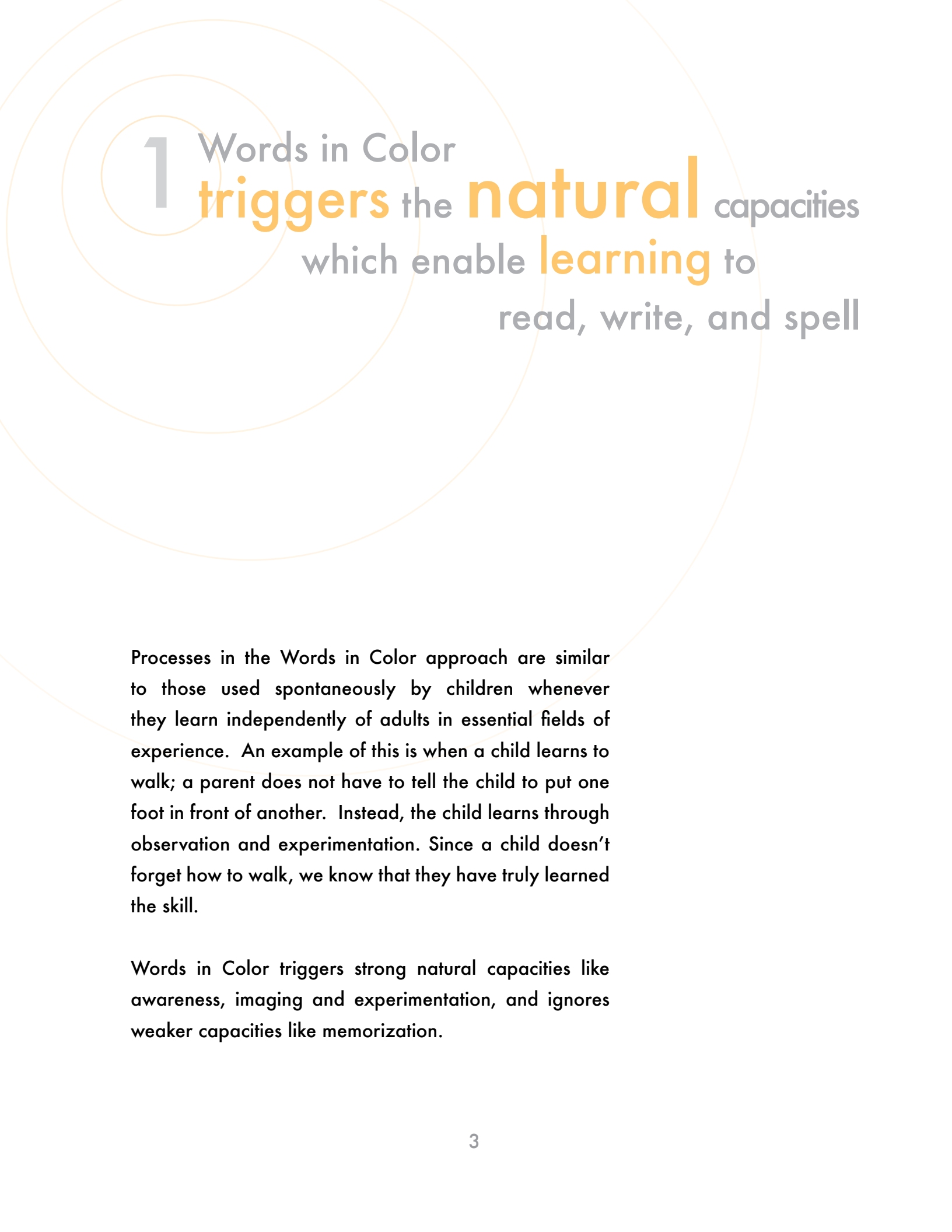| | | | | | | | | | | | | | | | | | | | |
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# Overview

The English alphabet has 26 letters, yet we use more than 26 sounds in our speech. In fact, American-English speakers use 59 sounds, and there are often many ways to spell the same sound – sometimes dozens of ways. This is very confusing for beginning readers because letters only show how a word is spelled, not how it is spoken. We have identified all 400+ sound-spellings in American English and organized them into 59 distinctly colored groups. With color, students can see how a word is spoken, and more quickly become aware of the nature of the written language.

Color provides students with a logical, phonetic basis for decoding and reading specific words.  One by one each sound-spelling is introduced and put into circulation with various teaching techniques.  Once initial connections have been made between the letter's shape, color, and sound, we engage the student in games that further explore the words, sounds, and spellings.  The challenge of the games increases, and additional exercises and activities are provided to help apply the students' knowledge. When done correctly, the process ends with mastery of the skill of reading, writing, and spelling.

Words in Color materials and teaching techniques are unlike any other in the world. There are several reasons why, but in this article we highlight 3 of them.

**1** Words in Color triggers the natural capacities that enable learning.

**2** Words in Color doesn't hide from the difficulties and ambiguities of written English.

**3** Words in Color was conceived out of a technical understanding of the learning process.
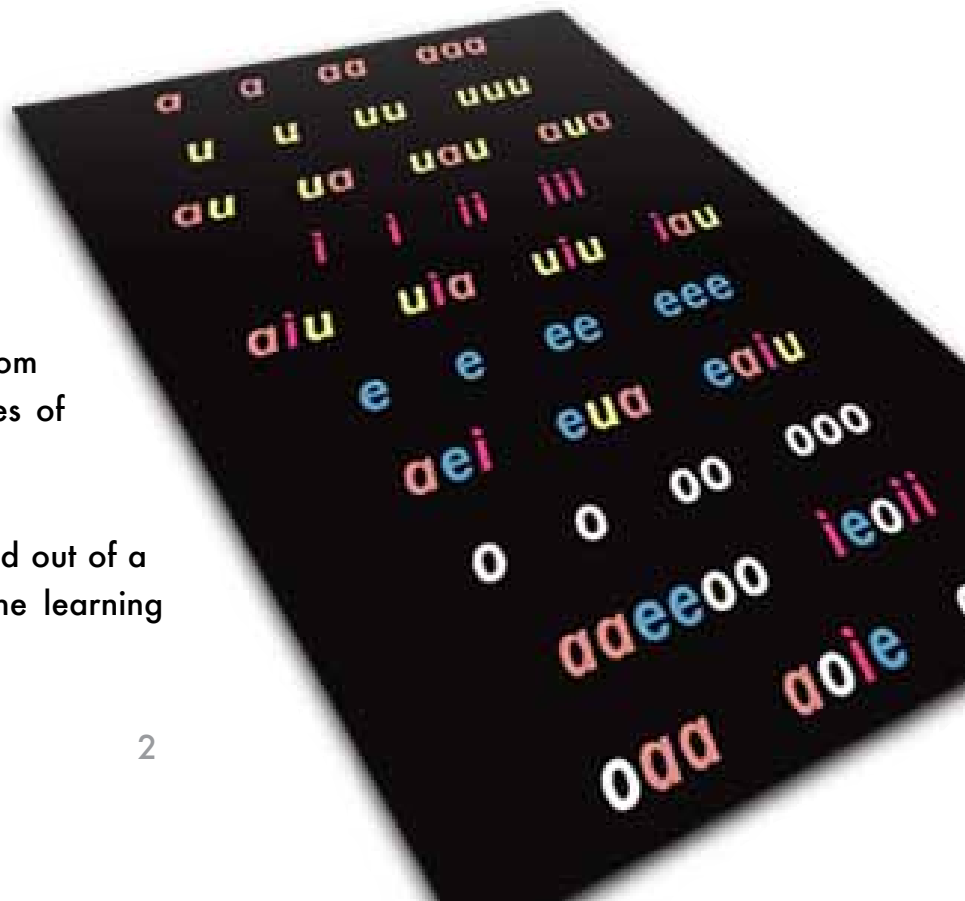
# 1 Words in Color
## triggers the natural capacities which enable learning to read, write, and spell

Processes in the Words in Color approach are similar to those used spontaneously by children whenever they learn independently of adults in essential fields of experience. An example of this is when a child learns to walk; a parent does not have to tell the child to put one foot in front of another. Instead, the child learns through observation and experimentation. Since a child doesn't forget how to walk, we know that they have truly learned the skill.

Words in Color triggers strong natural capacities like awareness, imaging and experimentation, and ignores weaker capacities like memorization.

# Example: Working on Sound Blends

We have found that some beginning, or very young, readers struggle with word blends or combining syllables. For example, if you are trying to help your student go from the syllables  po  and op to the word pop, or from the syllable pa and at to the word pat, the following technique may be helpful.

- The teacher taps the sequence p  a on the Fidel Phonic Code, and asks the student read it.
- The teacher taps the sequence a  t, and asks the student to read it.
- The teacher writes pa and at on the board or a piece of paper.  The teacher then tells the student:
- "Take this sound (pa) and put it in this hand (left hand) and make a fist."
- "Take this sound (at), put it in the other hand (right hand) and make a fist."
- "What do you have in this hand (the left one)?"
- "What do you have in the other one (the right one)?"
- "Say this one (the left one), now say the other one (the right one)."
- "Now lets take our hands and put them close together – say the sounds in each hand."
- "Now lets put our hands closer still – say the sounds."
- "Next lets put them right beside each other – say the sounds."
- "Now lets clap our hands together – how do we say the sound now?"

At this point some students may pause to think through how they would say the sound.  It is important that the teacher give them time to work it out.  If they don't immediately get it, or if they give up, we do not suggest giving the answer to them.  Rather, try the exercise again.  A second time through might trigger something that leads to an awareness of how to pronounce the sound.

# Example Continued . . .

If they are successful in producing the sound, the following steps could take place:

- The teacher then goes to the Fidel Phonic Code and taps the sequence <u>p</u> <u>a</u> <u>t</u> and says, "This is the word you have just said."
- "Can you find it on the Word Charts?" (Chart 2.)
- After the student has found it.  The teacher could then ask:
- "Are you sure this is the word?"
- "How do you know this is the word?"
- "Can you say this word?"
- Lets go and get the sounds in each hand again. What is in the left hand, the right hand?  What do you get when you put them together? Does it make the same sound as this one (the word on the charts)?"

Following this initial sequence, the teacher could try another one – perhaps the reverse of the previous word <u>pat</u> » <u>t</u> <u>a</u> <u>p</u>.  This time however less structure and assistance would be provided:

- The teacher writes <u>ta</u> and <u>ap</u> on the board or on a piece of paper
- The teacher then asks the students to repeat the exercise.  (This time the teacher refrains from prompting with questions.)

pat pit pet pot

pop at it up putt

tot top tip tap apt

as pep us pup is

After successfully working through the first challenge of combining <u>pa</u> and <u>at</u> to give <u>pat</u>, students become aware of the algebra in spellings and words. In other words, they learn that different signs can be combined to represent different sounds, and many combinations can be put together, taken apart, reversed and so on. In all subsequent reading challenges, there is no need to re-learn this – only to apply it in new situations.

In our experience, young learners often find this sort of activity very engaging – and there is absolutely no need for artificial praise or cajoling to get the student to participate. What is important to note is the degree to which the student is involved. It is deep, meaningful involvement in an activity that is highly relevant to the overall challenge of becoming a reader. This is a key characteristic of Words in Color.
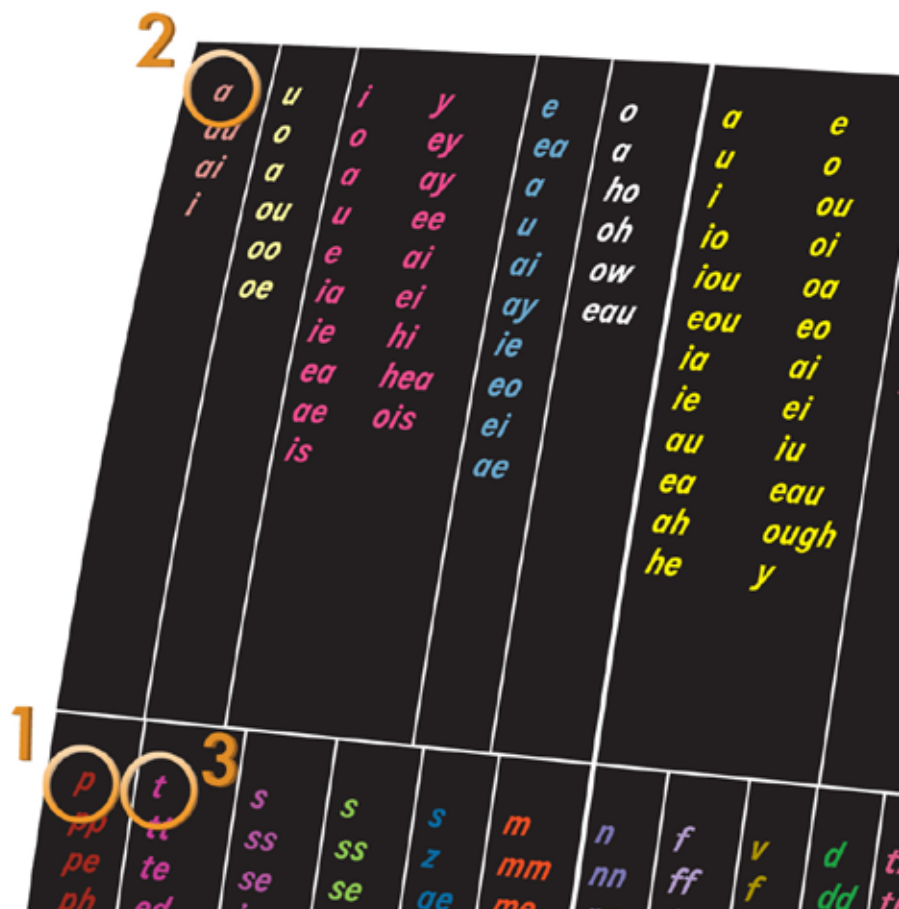
## In the example above, please note:

- At no time did the teacher give the answer. Instead, the activity was designed to present an educational challenge.

- When we present a challenge, we trigger the students' natural capacities that enable learning. In this case we are making deliberate use of the capacities of: awareness, action, perception, synthesis, imaging, abstraction, and imagination among others.

- When students work through a challenge, they call on previous experience as input into the way forward. And with this, their intelligence is easily activated without excessive mental strain or effort.

- With manageable challenges like this, students can add to their history of successful learning encounters. This positively shapes their attitude and appetite for more learning as they prepare to launch into the next challenge.

Presenting well-constructed educational challenges to students is an excellent technique to trigger their natural capacities that enable learning. Words in Color materials are flexible and appropriate for creating, presenting, and extending the right kind of challenges in order to develop a students' reading, writing, and spelling skills.

# First Really Good Question:

Ask this question when evaluating materials and approaches for teaching and learning to read, write and spell:

How do these materials make it possible for the teacher to trigger the students' natural capacities that enable learning?

Words in Color is the only program that we know of that was specifically designed with this purpose in mind.

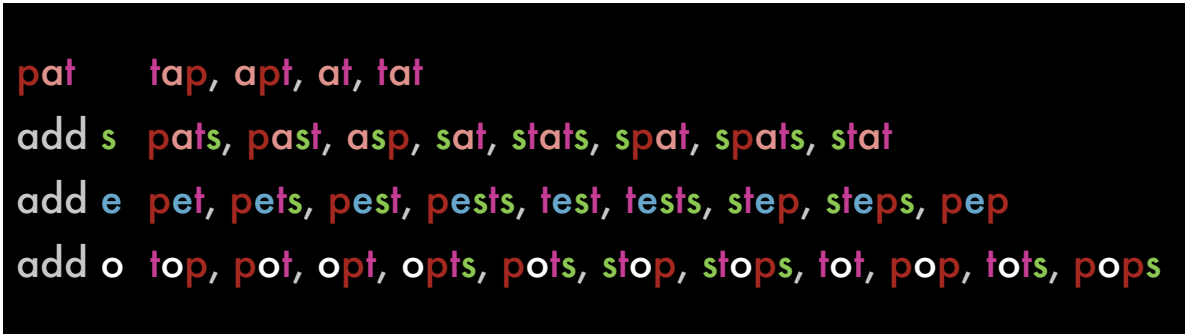# 2 Words in Color materials don't hide from the difficulties and ambiguities of learning to read, write, and spell

We will highlight two characteristics of English which make the challenge of learning to read, write, and spell unique. First is its algebraic quality; English sounds, syllables, and words can be combined using multiple processes. The second is its non-phonetic nature; we can't "sound out" English words based on the individual letters we see. We will further explain these two characteristics in the pages to come.

Most literacy approaches don't address these characteristics. We feel that avoiding the nature of English not only slows the learning process, but causes unecessary confusion and frustration. Words in Color tackles the difficulties of learning to read, write and spell head on.

# Written English is highly algebraic:

Letters, syllables and words can be combined in many different ways. By placing emphasis on the processes for combining these elements, we set the stage for significant acceleration in learning outcomes.

For example: Starting with the sounds and spellings in the word pat, we can generate the words tap and apt just by combining the sounds differently. If we add new sounds to the mix we can generate many new words.

```
pat      tap, apt, at, tat
add s    pats, past, asp, sat, stats, spat, spats, stat
add e    pet, pets, pest, pests, test, tests, step, steps, pep
add o    top, pot, opt, opts, pots, stop, stops, tot, pop, tots, pops
```

In the example above there are 33 words, using 6 sounds/ spellings (a, e, o, s, p, t ). What seems more efficient? To teach each of the 33 words individually, or to teach the 6 sounds/spellings and the very few processes for combining them? In our analysis, it is strikingly clear. You can significantly accelerate learning outcomes by placing appropriate emphasis on the processes for combining sounds, spellings, syllables and words. The materials, teaching techniques, and games in Words in Color are designed to make use of this algebraic characteristic of the language.
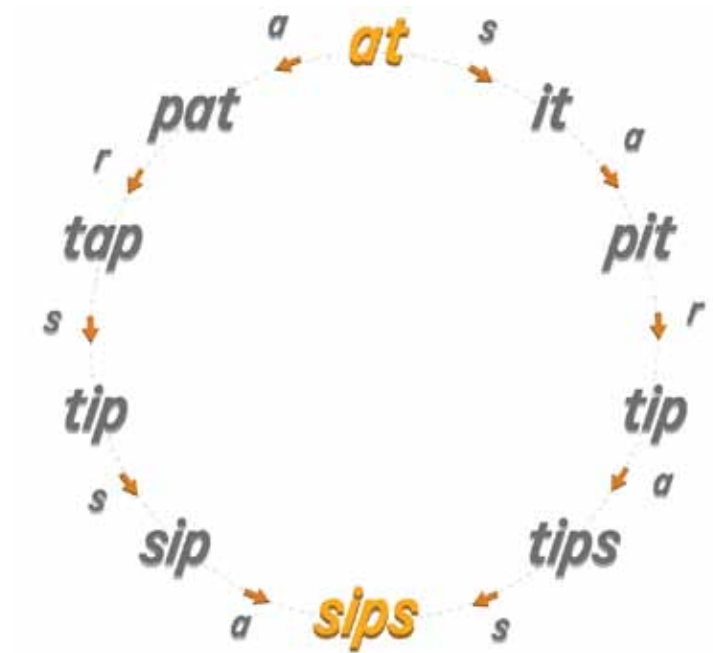
# Game: Accelerating learning by focusing on the algebraic nature of English

The Transformation Game is found in Words in Color Student Workbook 1, and asks students to transform one word into another. It is amazing how involved both children and adults get when presented with the challenge of this game. The object of the game is to go from one word to another using only four operations, and making only one change at a time:

- (s) substitution (of one sound for another)
- (a) addition (of one sound at the front or end of a word)
- (i) insertion (of one sound within a word)
- (r) reversal (of the sounds of a word)

The basis for the game is not single letters but signs, each of which may contain several letters representing one sound. Each step must produce a legitimate English word. In most cases, there is more than one way to go from one word to another.

(Note that subtraction is not permissible in the game, although it is obvious that it can be used for word formation. It would reduce the interest of the game by making almost all challenges much too easy.)

Transformation Game Example 1: from at to sips
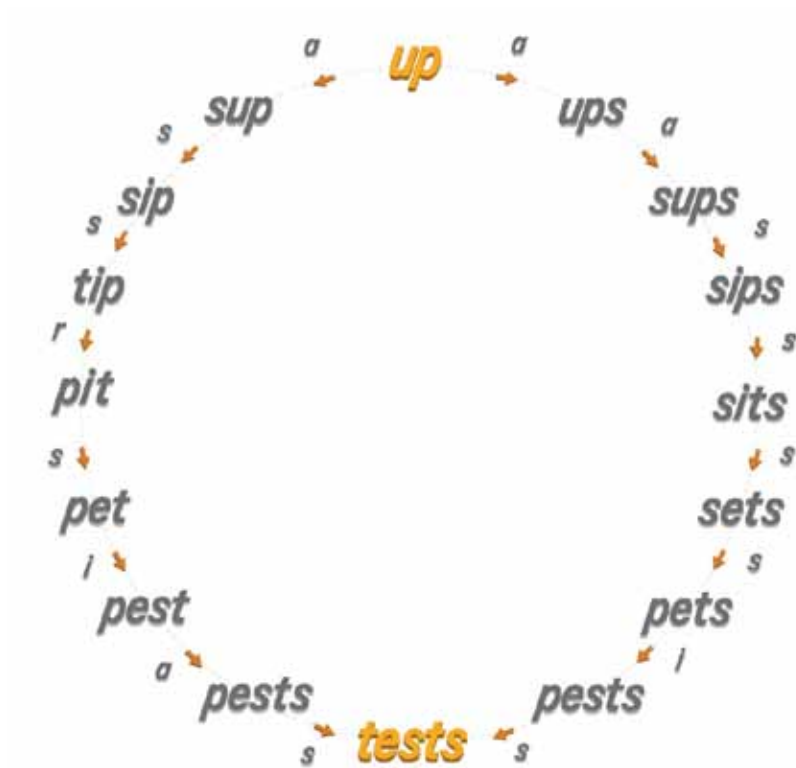


Transformation Game Example 2: from up to tests

# Teaching Technique

Accelerating learning by focusing on the algebraic nature of English

If a student is able to read the word pat the teacher may ask the student to then read the word tap.  The sounds used in pat and tap are the same, but in a different algebraic combination.  If a student cannot read tap, the teacher may construct a challenge in the following way using the Fidel phonic code and a pointer, and tapping out sequences of signs as shown in the progression below:

**1**

Deconstruct the word pat

Challenge 1: pat
Challenge 2: pa
Challenge 3: at
Challenge 4: a

**2**

Re-construct the word tap

Challenge 5: ap
Challenge 6: ta
Challenge 7: ta  ap
Challenge 8: tap

**3**

Practice reading contrasting tap and pat

Challenge 9: pat
Challenge 10: tap
Challenge 11: pat » tap » pat
Challenge 12: tap » pat » tap

**4**

Extend the challenge to apt

Challenge 13: tap » pat » apt

Notice in this last challenge the word <u>apt</u> is introduced. It has the same sounds as <u>tap</u> and <u>pat</u>, just appearing in a different order.  With a little experimentation, students can decode and read this new combination.

This way of working can easily be extended to first simple and then more complex sentences.  For example:

**1**

it  is  pat
is  it  pat
pat  is  it

**2**

pat  is  apt
is  pat  apt

**3**

pat is apt to tap it
is pat apt to tap it

Practicing sound combinations in this way accelerates learning by reducing the amount of energy and effort required of the student. Rather than memorize the dozens of words that can be formed with these 6 signs, students only need to learn the skill of combining signs. This skill only needs to be learned once, and can be applied in different situations.

## Second Really Good Question:

Ask this question when evaluating materials and approaches for teaching and learning to read, write and spell:

Do the materials and related teaching techniques focus on the memorization of multiple spellings, or on processes for combining sounds and spellings?

# Written English is non-phonetic:

English is riddled with ambiguities.  For example, how do you read the word "wind" – as in the <u>wind</u> blows, or as in to <u>wind</u> the clock?  And what about <u>sweet</u> and <u>suite</u> with the same sound but different spellings?  The problem grows when you take <u>suite</u> and <u>suit</u> – the same vowel combinations produce entirely different sounds.

So how can a teacher ask a struggling beginning reader to "sound out" the difficult word, when specific spellings don't always create the same sound? Most programs for teaching and learning to read, write and spell avoid or superficially address such ambiguities. This leaves students with an incomplete understanding of the language, and unresolved questions.  With Words in Color, the ambiguities are presented in color. Color allows the students to see for themselves what is the same about the presented words, and what is different. After the words are examined and experimented with, students transfer their knowledge of the language to standard black-and-white type.

during autumn daughter

pure taught water poor

doubt awe oh saw sore

tough laugh soar cough

thought through though

bough thoroughly help

board sew sow bored

cloak broke clock sow

sweet fruit suit suite

Words in Color Word Chart 16

# Example: Words in Color Word Chart 16

The ambiguities introduced on this chart are a small fraction of those that exist.  However, they are representative of the complexities in a non-phonetic language. Take a look at the following list of words. Which sounds do you see that are colored the same? Can you see a spelling that is colored in different ways? Why do you think that is?

- sew, sow, and sow
- suit, suite, and sweet
- soar, sore, board, and bored
- tough, cough, thought, through, though, bough, thoroughly
- sow, bough, doubt
- sow, though
- autumn, taught, cough, thought

With Words in Color, each sound is given its own unique color.  This transforms the language into one that, from an educational perspective, can be seen as phonetic.  In other words, students can look at the colors and accurately "sound out" the word. We are not aware of any other approaches to teaching reading, writing and spelling that deal with the ambiguous nature of the language in such a thorough and complete way.

# A Closer Look at Ambiguities . . .

There are two types of ambiguities:  The first stems from the fact that there are several different ways to spell the same sound.  For example, consider the 10 different ways to spell the sound "<u>e</u>" as in "<u>pet</u>."

| Spelling 1: | e as in pet |
| Spelling 2: | ea as in lead |
| Spelling 3: | a as in any |
| Spelling 4: | u as in bury |
| Spelling 5: | ai as in said |
| Spelling 6: | ay as in says |
| Spelling 7: | ie as in friend |
| Spelling 8: | eo as in leopard |
| Spelling 9: | ei as in heifer |
| Spelling 10: | ae as in aesthetic |

For the second ambiguity, individual spellings can be pronounced in several ways. Consider the multiple pronounciations of the sign "e."

Spelling 1:   e as in English

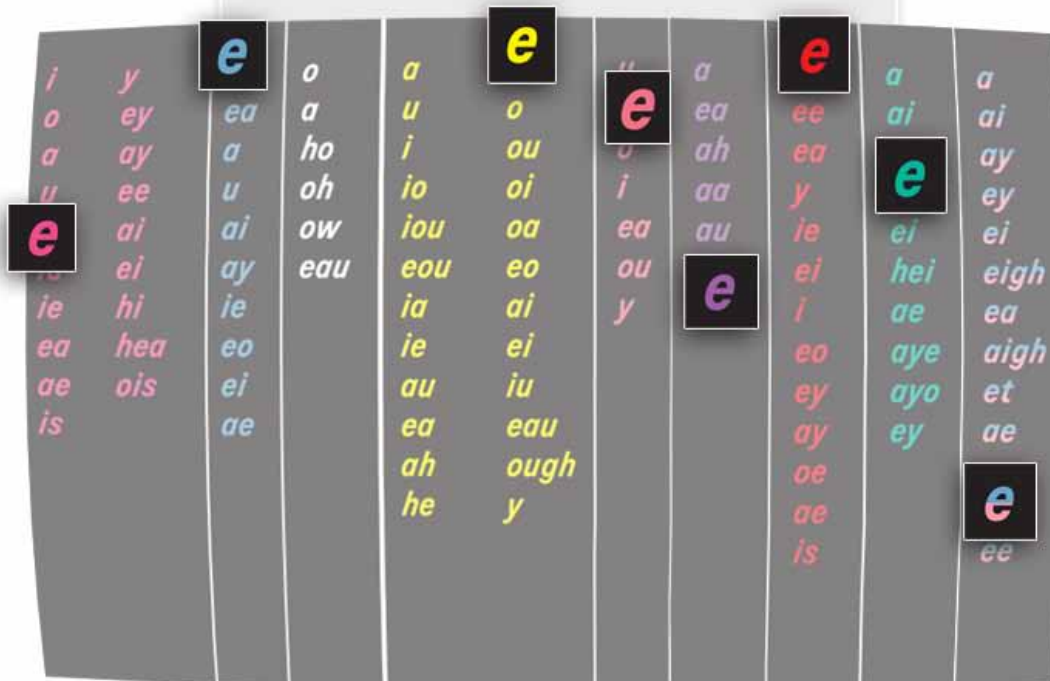Spelling 2:   e as in pet

Spelling 3:   e as in the

Spelling 4:   e as in her

Spelling 5:   e as in sergeant
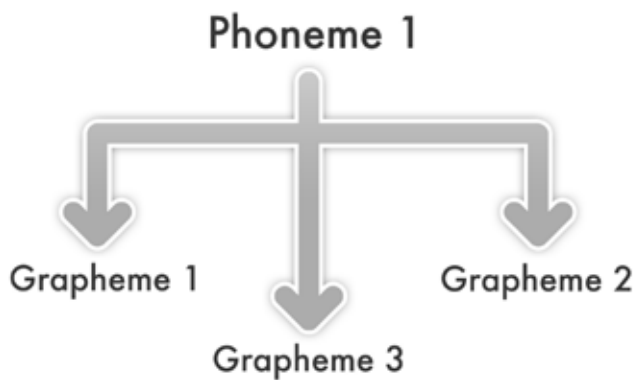
Spelling 6:   e as in we

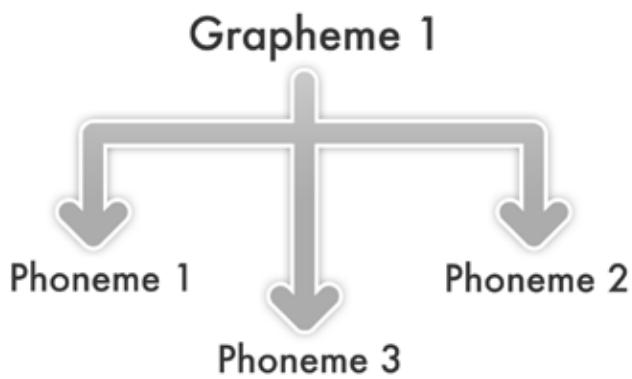Spelling 7:   e as in there

Spelling 8:   e as in suede

# Ambiguities continued . . .

In more technical terms, we summarize as follows: for individual phonemes (sounds), there can be multiple graphemes (spellings).

## Phoneme 1

Grapheme 1  Grapheme 3  Grapheme 2

And, for individual graphemes (spellings), there can be multiple phonemes (sounds).

## Grapheme 1

Phoneme 1  Phoneme 3  Phoneme 2

# Third Really Good Question:

Ask this question when evaluating materials and approaches for teaching and learning to read, write and spell:

What is the approach for addressing the two types of ambiguities in written English? And how do the materials provided support this approach?

**3.** Words in Color was conceived
out of a technical understanding
of the learning process

"I don't teach, I let them learn."

- Caleb Gattegno

The creator of Words in Color, Caleb Gattegno, evolved his theories of learning and education over decades of research.  With respect to learning in general, and learning to read, write, and spell, the following works are suggested:

- The Science of Education, Part 1:  Theoretical Considerations
- The Science of Education, Part 2A:  Reading, the Social and Human Challenge
- The Common Sense of Teaching Reading and Writing
- In the Beginning There Were no Words: The Universe of Babies
- Teaching Reading with Words in Color: A Scientific Study of the Problems of Reading
- The Problem of Reading is Solved, Harvard Educational Review, 1964

In these works, learning is defined as becoming aware.  The stages of consciousness in learning are:

1. Contact with the unknown
2. Exploration & experimentation
3. Practice & consolidation
4. Transfer & utilization

Words in Color is designed with the flexibility to be used in each of these stages. To educate a student to the fullest, none of these stages can be overlooked.

# Example:  Introducing a New Spelling

This example shows how Words in Color can be used in the earlier stages of the learning process – contact with the unknown, and exploration & experimentation.

If your students know the word <u>fan</u> (Word Chart 3) and the word <u>let</u> (Word Chart 4), they have been given enough criteria for them to accurately read and spell the word <u>laugh</u> (Word Chart 16).

Start by separately tapping out <u>f</u> <u>a</u> <u>n</u> and <u>l</u> <u>e</u> <u>t</u> on the Fidel Phonic Code, and have the student say the words. Then point to the words on Word Charts 3, and 4, and have them say them again. Now, tap on the same <u>l</u> (as in <u>let</u>), the <u>a</u> (as in <u>fan</u>) and the <u>f</u> (as in <u>fan</u>).  Have them say <u>laf</u>.

Now introduce the correct spelling of laugh.  Tap on l (as in let), then under the same column in the Fidel as the a (as in fan), tap on the au spelling, then tap the f (as in fan).  You have tapped out lauf.  Make sure the student pronounces the word the same as before.  Repeat the process, this time tap the gh in the same column instead of the f.  Repeat the process if your students are having difficulty reading the word laugh. You could then show laugh on Word Chart 16.

This exercise can be done for a wide range of new words. For words that are not on the Word Charts, you will be able to tap all the spellings in the English language using the Fidel.

# Example:  Visual Dictation

Visual Dictation is a game that can be used for learning stages experimentation & exploration, and practice & consolidation. It is played with the Fidel phonic code, and a pointer in this way:

- On the Fidel, the teacher taps out a sequence of signs, for example:  p a t

- When the teacher has finished tapping out the sequence the student says the word:  pat

The rhythm and speed of tapping can be varied to make the game more challenging and more interesting.  The complexity and difficulty can be increased or decreased by varying the length of the sequences tapped.  For example:

- a t » p a t » p a t s

The students' depth of understanding can be checked by varying the sequence of signs tapped.  For example:

- p a t s » p a s t » s p a t » s p a t s » t a p s

When a student has read the word successfully, the teacher may ask them:

- To tap the word on the Fidel themselves.

- To close their eyes and take a mental photograph of the whole word.  This helps with retention.

- To close their eyes and tap the same sequence in their minds – the teacher could ask them:  Can you see the first sign/color? The second? The third? And so on. This helps with retention.

- To close their eyes, tap the sequence in their minds and say the word out loud, then ask what the reverse is – say the word, then tap it out.  After they have done this with their eyes closed, the teacher could ask them to do it again on the Fidel.  This helps with achieving high levels of performance and retention.

- Say the word with different tones of expression.  For example:  with happiness, with anger, with confusion, with skepticism, etc.  This helps with understanding meaning.

# Visual Dictation continued . . .

The teacher may also ask one student to assume the role of teacher.  In this scenario, one student taps out the sequence, and another student reads aloud what has been tapped out.

The teacher could then ask another student, or the whole class; "What do you think? Is it correct?"  If they feel it is not correct, the teacher could ask them tap the correct sequence themselves.  There are several ways the question can be asked:

- "Is it correct?"
- "What do you think?"
- "Are you 100% sure?"
- "How would you change it?"

## Fourth Really Good Question:

Ask this question when evaluating materials and approaches for teaching and learning to read, write and spell:

# In what way are these materials compatible with, and supportive of, the actual learning process?

# Appendix

Ask these questions when evaluating materials and approaches for teaching and learning to read, write and spell:

## First Really Good Question

How do these materials make it possible for the teacher to trigger the students' natural capacities that enable learning?
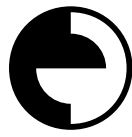
## Second Really Good Question

Do the materials and related teaching techniques focus on the memorization of multiple spellings, or on the processes for combining sounds and spellings?

## Third Really Good Question

What is the approach for addressing the two types of ambiguities in written English? And how do the materials provided support this approach?

## Fourth Really Good Question

In what way are these materials compatible with, and supportive of, the actual learning process?