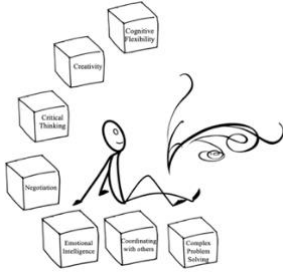


# Scaffolding Academic Language with Intentional Errors (Secondary)

Donna Lee Fields, Ph.D.



*theory behind the scaffold...*

*The brain sparks and grows when we make mistakes - even if we are not aware of it - because it is a time of struggle: the brain is challenged, and this is the time when it develops the most.*

Boaler, Jo  
*Mathematical Mindsets*

**E**rrors need to be celebrated in our classroom and we need to help our students to embrace the effort they make in their studies and focus on the process - mistakes and successes alike - and not only the outcomes.

**T**his scaffold puts a twist on the concept of celebrating mistakes. To truly show our students how errors are valuable for their own development, we create a whole activity around mistakes that we have intentionally embedded in the unit, lesson, or project they are about to begin. At the end of the activity, we further expand the dynamic by helping them to reflect on the steps of the activity - how they felt having the opportunity to consider different alternatives instead of receiving the information without any opportunity to collaborate or participate. Essentially, they'll be reflecting on how it feels to learn through an action!

**A**s in best learning practices, this technique encourages students to use past knowledge to recognise inconsistencies in the information. Through critical thinking, they work together not only to read and understand the concepts, but they also look for content and grammatical errors and then make the appropriate adjustments (they suggest more accurate academic language).

**T**o cater to even more learning styles and to adhere to the changes the OECD (through the PISA exams) encourages, this activity asks students to physically move throughout the classroom, and interact with the material and their classmates at the same time. The example we use here is from a unit on natural sciences, but you'll see how you can adapt it to your subject with ease.

**C**omments from teacher in Helsinki, Finland: 'I was at first very reluctant to use this scaffold because I thought my students would be overwhelmed with the difficulty of the task. What I found was that the activity is not only incredibly effective, but the students become very quickly engaged and interactive. Once we begin the unit, they realise how prepared they already are for the language they'll need to understand. Now I use this technique often and with pleasure!'

Errors can be seen used as jumping blocks for learning and are often undervalued in the process of advancing knowledge.\* The mistakes students make can be used as formative assessment and as critical indicators for where teachers can focus more concentration on dedicated instruction.

The scaffold below is tied to the theory of deductive reasoning: a person makes conclusions based on past knowledge and logic. Students use previous studies to find errors deliberately placed in texts taken from units they are about to begin. This helps them to make connections and to transition into the new material with more confidence.

*\* Academic success 'is intricately linked to higher-order thinking processes developed by extensive modeling and scaffolding of classroom talk and accelerated by weaving direct teaching of its features while teaching content concepts.'* (Zwiers, 2008).

**\*\*Hunt, Morton (1982). *The Universe Within: A new science explores the human mind.* Simon and Schuster.**

**step by step...**

1. From a unit you're about to begin, make two (2) copies of 8-10 of the pages (so that in the end you'll have more or less 20 copies to mount on the wall.)

**UNIT 02 Matter and its states**

**1 Matter**

Which two properties are essential to consider something matter?

Matter makes up everything around us, from the objects in our bedrooms to the most distant stars. However, qualities such as weight or beauty, goodness or evil... these are not made of matter.

Matter is everything which has mass and occupies volume. All bodies found in the Universe are made up of matter.

Water, trees and wood are matter because they have mass and occupy a definite space. In other words, they have volume. However, each of these elements is made up of different types of atoms, which is called a substance.

A substance is any of the different types of matter.

Is a gas such as air, is it matter? In fact, we make conditions that air has mass and occupies volume.

Let us look at two very simple experiments.

**Air has mass**  
Place an empty balloon on one side of the scale and on the other side, place an identical balloon filled with air. See how the scales go down on the side of the filled balloon. This shows that the filled balloon has a greater mass than the empty balloon. The difference is due to the mass of the air inside the balloon.

**Air occupies volume**  
Take a bucket of water and place inside it an inverted tube also filled with water. Through a rubber stopper, blow air into the tube. See how the level of water in the bucket rises, while the level of water in the tube falls. What happens the space created in the tube? It is occupied by air, which pushes air has volume.

The two experiments above show that a gas such as air is made up of matter because it has mass and volume.

**ACTIVITIES**

1. Which method have you studied which would be appropriate to use for the two experiments above?
2. A balloon expands when you blow into it. What does this show with respect to gases? If you weigh the balloon before and after blowing it up, what results will you obtain? What do these results mean?
3. Explain the difference between matter and substance.
4. Classify the following things as matter and non-matter:
  - a. A book
  - b. Intelligence
  - c. Beauty
  - d. A violin
  - e. Oxygen
  - f. A mobile phone
  - g. Science
  - h. Love

**States of aggregation**

What does the kinetic molecular theory of matter say?

Substance can appear in three physical states or states of aggregation.

**SOLID**  
Shape and volume are constant. Cannot be compressed or expanded without causing deformation.

**LIQUID**  
It adopts the shape of the container, but its volume is constant. It is compressible or expands very little.

**GASEOUS**  
It adopts the shape of the container and its volume can vary through compression or expansion.

Substance can pass from one state to another; it is necessary to change the temperature or pressure.

Example: at normal atmospheric pressure, water is liquid at 25°C, gaseous 6°C and solid at -1°C.

**What is matter like inside?**

could look at a body using a very powerful microscope, we would see that matter is made up of tiny particles called atoms, which are more or less joined to each other and in continuous movement.

**kinetic molecular theory of matter** says that matter is made up of very tiny particles called atoms, which are in continuous movement, and that we can observe their behavior in the solid, liquid and gaseous states.

**SOLID**  
particles are held together by strong attractive forces. They are very close together and occupy fixed space around. They vibrate but they cannot move from one place to another, the structure of the solid is rigid.

**LIQUID**  
The particles in liquids are held by much weaker forces than those in solids. They can move around each other, in that the liquid can adopt different shapes. In other words, it is fluid or soft.

**GASEOUS**  
The particles in gases are held by much weaker forces than those in liquids. Separated by large distances, they can travel with total freedom through chaotic movement. In this way, they tend to occupy all the available volume.

**ACTIVITIES**

Explain which of the characteristics of particles justifies the fact that the volume and shape of solid substances are constant.

10. Justify, according to the kinetic molecular theory, why gases can be compressed.

**14 How are the changes of state produced?**

The explanation is based on the kinetic molecular theory of matter, based on the movement of particles. To understand this, we should look at how results the changes of state are produced:

**FUSION**  
When the temperature of a solid increases, its particles vibrate faster and faster until they overcome the forces keeping them joined. They then become separated from the fixed positions which they occupied in the solid structure. During fusion, the energy supplied is used to break up the solid and change its structure, but not to raise its temperature. For that reason, at its melting point the temperature of the solid remains constant.

**VAPORIZATION**

**Evaporation** When the particles in liquids move, they bump into each other. As they have different positions, the fastest, with the greatest energy, reach the surface of the liquid and escape, becoming gaseous. This is how liquid evaporates.

At a higher temperature, on the surface of the liquid there will be more molecules with enough energy to become a gas. For that reason, the evaporation is greater there.

**Boiling** On progressively raising the temperature of a liquid, its particles acquire greater energy and move increasingly faster. In the end, they overcome the weight which they are supporting due to atmospheric pressure. Bubbles form inside the liquid and, as they rise to the surface, they get bigger. At the surface they burst and the gas escapes into the atmosphere. At that point the liquid is boiling.

During boiling, energy is used to change the structure of the liquid, so its temperature remains constant at the boiling point.

We now know how these changes of state are produced, but what factors influence them? Two factors influence the changes of state: temperature and pressure.

**ACTIVITIES**

11. What do the particles of a gas do when the temperature increases? Why?
12. Explain whether in a liquid all the particles have the same velocity.
13. Is vaporization the same as evaporation?
14. What are the differences between evaporation and boiling?

2. Change 3-4 words on each page. (Don't worry if the words you change are obvious because of the font or colouring. This will show your students where the error is, but they still need to read to conceptualise an appropriate word to put in its place.) See example below.

**4.1 How are the changes of state produced?**  
The explanation is found in the kinetic molecular theory of matter, based on the movement of particles. To understand this, we should look at how two of the changes of state are produced.

**FUSION**  
When the temperature of a solid increases, its particles vibrate faster and faster until they **overcome** the forces keeping them joined. They then become separated from the fixed positions which they occupied in the solid structure.  
During fusion, the energy supplied is used to break up the solid and change its structure, but not to raise its temperature. For that reason, at the **melting point** the temperature of the solid remains constant.

**VAPORISATION**  
• **Evaporation:** When the particles in liquids move, they **bump** into each other. As they have different velocities, the fastest, with the greatest energy, reach the surface of the liquid and escape, becoming gaseous. This is how liquid evaporates.  
At a higher temperature, on the surface of the liquid there will be more molecules with enough energy to become a gas. For that reason, the evaporation is greater there.  
• **Boiling:** On progressively raising the temperature of a liquid, its particles acquire greater energy and move increasingly faster. In the end, they overcome the weight which they are supporting due to atmospheric pressure. Bubbles form inside the liquid and, as they rise to the surface, they get bigger. At the surface they **burst** and the gas escapes into the atmosphere. At that point the liquid is boiling.  
During boiling, energy is used to change the structure of the liquid, but its temperature remains constant at the **boiling point**.

We now know how these changes of state are produced, but what factors influence them? Two factors influence the changes of state: **temperature** and **pressure**.

**ACTIVITIES**  
11. What do the particles of a gas do when the temperature increases? Why?  
12. Explain whether in a liquid all the particles have the same velocity.  
13. Is vaporisation the same as evaporation?  
14. What are the differences between evaporation and boiling?

When the temperature of a solid **decreases**, particles vibrate faster and faster until they **overcome** the forces keeping them joined. They then become separated from the fixed positions which they occupied in the solid structure.

**Evaporation:** When the particles in liquids move, they **bump** into each other. As they have different velocities, the fastest, with the greatest energy, reach the surface of the liquid and escape, becoming gaseous. This is how liquid **disappears**.

**Boiling:** On progressively raising the temperature of a liquid, its particles acquire greater energy and move increasingly faster. In the end, they overcome the **air**, which they are supporting due to atmospheric pressure. Bubbles form inside the liquid and, as they rise to the surface, they get bigger. At the surface they **burst** and the gas escapes into the atmosphere. At that point the liquid is boiling.

3. Mount the pages on the walls of the classroom (more or less 20 pages mounted around the classroom)
4. Make a table to identify the pages, with one column to identify the inappropriate word and one column indicating what word would be more appropriate. (See below.)

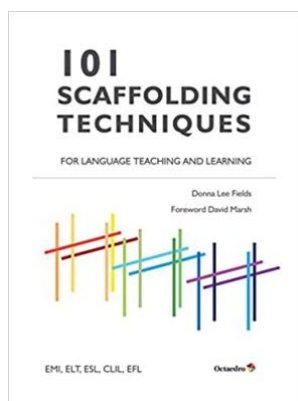
Page Number	Inappropriate word	More appropriate word with our justification
15	decreases	increases It makes more sense to say that when the temperature of a solid <i>increases</i> the particles vibrate faster.
15	disappears	evaporates the paragraph is about evaporation. Liquid never disappears, it changes form. In this case, it evaporates.
15	air	weight Particles do not support air. They support weight.

5. In pairs, students go around the room, read the paragraphs, and together decide which words are inappropriate, and what might be an appropriate word. (See example below.) As long as they write in a word they can justify, we can be satisfied. Later, they will read the word that the publishers have decided is the most appropriate. The goal here is critical thinking and drawing appropriate conclusions, not 100% accuracy.
6. *Formative Assessment/Reflection:* Students write the answers to the following questions from the Question Continuum. (*Remember, some questions reflect content and others reflect methodology, thus augmenting [self-efficacy](#).*)



- Yes/No Does water evaporate when heated?
- Which Which elements are constant in shape and volume?
- Who Who studies the characteristics of particles and their changes?
- When When are kinetic molecules compressed?
- Where Where does most evaporation occur on the planet?
- What What is the purpose of knowing the information in this unit?
- How How are changes of state produced?
- Why Why is the concept of fusion important when travelling by water in colder climates?
- What if What if you discovered that man of the concepts in this unit were not proven as scientifically accurate. How would that change your concept of the world around you?

*find more scaffolds here...*

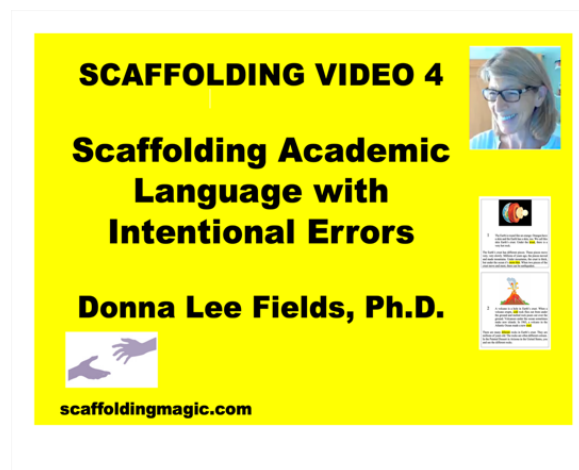


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video explanation...



transcript of video explanation...

Hi, I'm Donna Fields and welcome to CLIL Scaffolding 4. This is series of webinars designed to give you quick, easy and adaptable scaffolding techniques. Scaffolding is an activity or technique that helps push students out of their zone of proximal development\*\* to a more complex level of knowledge. (I use the image: giving a helping hand!)

Today, we're going to talk about how to use scaffolding technique #52, that you can find in my book *101 Scaffolding Techniques For Language Teaching And Learning* and has been translated into Spanish.

Today the objective for this session is show how easy it is to use scaffolding technique #52 in a primary and secondary lesson. You can also use it in adult classes, professional training, any classes you teach and in any language.

Scaffolding technique #52 is called 'Something's not right'. The idea is that you're going to present text that your students are responsible for learning with deliberate mistakes included. You're going to tell your students there are mistakes, and their job is to find them. By finding the mistakes they're going to have to read the text, consider the corresponding images, and use deductive reasoning and previous studies of language and content to locate where the 'something not right' is.

Let's begin with a secondary history class. These are the first few pages of a chapter on the middle ages. The images are nice and they're large, but there's a lot of written information that's not explained in the images and a lot of reading the students will have to do. This is a CLIL class, so the language of the text is different from the students' home language. They'll need to assimilate a lot of new concepts in a language that they may not be completely comfortable in. In other words, it's going to be overwhelming for most of them. So what can we do? I'll show you. it takes a bit of preparation, but it's worth it and you can use it year after year.

First, you make copies of several pages of the chapter with the images. (I usually make copies of 10-15 pages.) Type the information into text boxes. include 2-3 mistakes in each page (and if you want, you can identify the type of mistake you've included for instance 3 spelling mistakes, 3 grammar mistakes, and so on), paste the text boxes on top of the corresponding page, laminate the pages (if you want), and post them around the classroom walls. (I've highlighted the mistakes here so you can see them. Obviously that's not what I show the

students.) I also put numbers on each page. You'll see what the numbers are for.

Now, I make tables for the students. So now, in pairs, they go around the room, read the text of each of the pages on the wall, write down the number of the page, find the mistakes and write them in the table. They also discuss the mistakes and write down the what they think the correction is.

Here is a table partially filled out. The students found the three spelling mistakes in page #5. You'll see that they don't have to go in numerical order as long as, in the end, they fill in the entire table.

You've now helped scaffold (pre-teach) content and language for the unit and catered to physical intelligence - letting them move while learning.

Let's try this with material from a primary geography class. The students need to read: Incredible Earth. The font is nice and big, the vocabulary seems easy, but you need to remember that learning content in a language that is not your home language is stressful for most students. So, let's break it down into smaller pieces, introduce it to them in an interactive way and give them an opportunity to feel proud of themselves by letting them to make deductive conclusions about content and language.

We

- scan in the pages of the reader (again, I usually use 10-15 pages which in this case is the whole book!)
- type in the text in text boxes
- include 1-2 mistakes in each page
- tape the textboxes to the corresponding page
- number them (laminates the pages if you want to)
- post them on the classroom walls
- give each pair of students a table, and with their partner
- they go around the room (it doesn't matter the order as long as they read all of them in the end)
- they read
- find the mistakes using past knowledge of the language and deductive reasoning for content, and
- write in what the correction probably is.

That's it! You've built a bridge for your students to cross from their previous studies to what they're moving into and in a way that's different and engaging. Classroom management obviously is key, here, but you can find very effective classroom management tips in my CLIL Giving a Helping Hand Webinar Shorts #4 to help you with that.

So, all you SUPER TEACHER out there, thank you so much again for joining.

I look forward to seeing you next time. Please leave me any comments at:  
You can find me at these sites:

<https://scaffoldingmagic.com/>

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and subscribe. There will be a lot more videos to come. Bye everyone!

**\*\*Zone Of Proximal Development:** The zone of proximal development is the difference between what a learner can do without help.

Mount.)