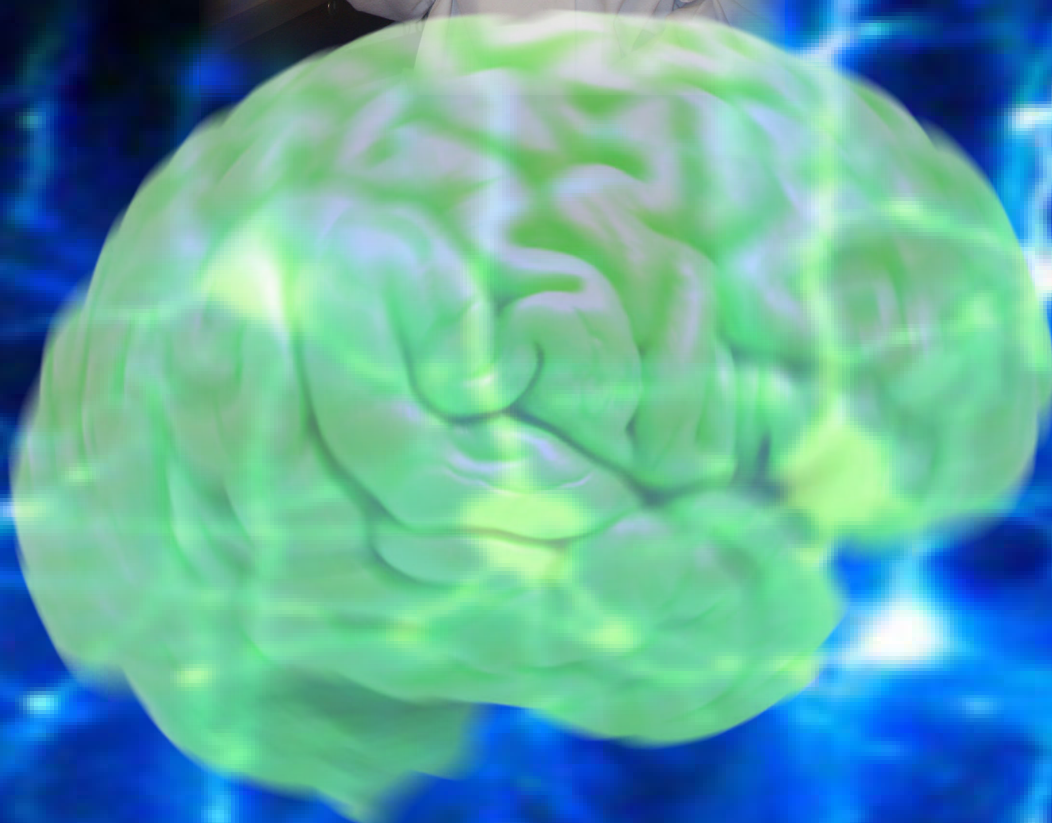


Six Weeks to a
BRAIN UPGRADE
A Student's Quick-Start Guide for Using
Brain Research to Boost Learning



*Just do
what
works!*



JANET N. ZADINA, PH.D.

How to Use the Student Workbook

This workbook can be used three ways:

1. As a stand-alone text in a study skills course
2. As a supplement in any course
3. As a required text for students to use on their own

An understanding of the overall format will help you determine how you want to use this in your course. Each unit or “week” contains three types of activities:

1. **Fire It:** This is the important “making connections” step wherein students think about what they already know so that they can connect the upcoming material to their existing network. These activities are very metacognitive: they help develop thinking about their thinking and frontal lobe functions. You can have students do this outside of class or use it as class discussion points or for group work. There are typically no wrong answers and this is not something you would grade. It is the *process* of doing it that is important.
2. **Lessons:** Each unit, chapter, or “week” contains five lessons. These do not have to be done in a week. For college students, the entire “week” could be one assignment. For middle or high school students you can use one or two weeks as you prefer. (There is another version that is a “chapter” format rather than a “week” format and you can specify you prefer the chapter format when you order). Each lesson is not meant to take more than 30 minutes for younger students or 10 minutes for fluent readers. These lessons are not graded. Each lesson has four parts:
 - a. **The Research:** This explains a relevant piece of research in easy-to-understand terms so the students see what they are being told is scientifically grounded. It is not just the teacher or parent telling them what is best, but what has been demonstrated through scientific research to be best.
 - b. **So What?** This is where the research is related to the students and how it might impact them.
 - c. **Just Do This:** This is a simple statement of a strategy or behavior they should immediately adopt and apply to their learning in any content area.
 - d. **Reflect and Connect:** An important part of any lesson is consolidation and reflection. This is the step that helps them use their frontal lobes and engage in metacognition. It can also be used for class discussion.
3. **Wire It:** This is the actual application step of what has been learned in the chapter (week) – the five lessons. When this textbook is used in a content area course, the student would do the appropriate tasks from the selection, applying them to the typical assignments that you would give. Some of these items would be suitable for handing in for a grade, should you desire to do so. You may require part or all of the items on the list.

For **students in grades 8-12**, you will want to use some guidance with this book. It is designed to take as little as 5 minutes a day every day or perhaps, 20 minutes once a week. However, time spent on this can be expanded into an entire course should you desire to do so.

For **college students** you may want to assign the entire week (chapter) once a week and require one or more of the *Wire It* activities to be turned in. I would suggest that you devote some class time to a discussion of the material during the week, but it does not need to be extensive.

This is primarily a **self-help book**. It can be done with no parental or instructional supervision. However, it makes an ideal supplement in any course because it contains only the *essential* and documented research about how to learn in the most efficient way. It is also very effective for student success courses because activities can be applied to homework in other courses and because it contains the latest brain research on how to learn and how to study effectively.

I welcome your feedback so new versions can serve you and your students even better.

Dear Student,

This book could change your life. Scientists have discovered that you can change your brain and you can become more intelligent. This book is going to show you how. With only 30 brief tips you will learn how to be smarter, not just get a better grade. You can make important changes to your brain.

I was a teacher before I became a cognitive neuroscientist specializing in Educational Neuroscience. This enables me to find, read, and understand the latest research about how we learn and how to make learning stronger and easier. It also enables me to understand what this means about what learners need to do in the classroom and how hard it is for some students to do well. I am not going to bore you with long explanations of “study skills.” No, we are going to take a “get it done” approach. I tell you what the scientists have discovered and what it can mean to you. Then I give you an important tip called *Just Do This*.

Here is a chance for you to make a big difference in your learning and your life skills. Please read about the research and then try out the tips from the “brain doctor” and see what happens. You can take charge of your brain! Start now! Just do it!



Sincerely yours,

Dr. Janet Zadina

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1. List your five senses
 - a. _____
 - b. _____
 - c. _____
 - d. _____
 - e. _____

2. For each sense, list how you use that sense when you are studying:
 - a. _____
 - b. _____
 - c. _____
 - d. _____
 - e. _____

3. Finish this saying: "A picture is worth _____."

4. Using several sentences, explain what this means. _____

5. How could you apply this to learning? _____

6. In a few sentences, explain how you organize items in your kitchen cabinet. _____

7. Why do you do that, and how could this apply to learning? _____

8. What is the purpose of taking notes in class? _____

9. What are your special tricks and strategies for taking notes? _____

10. Do you ever know something, but can't say it? Why do you think this happens? _____

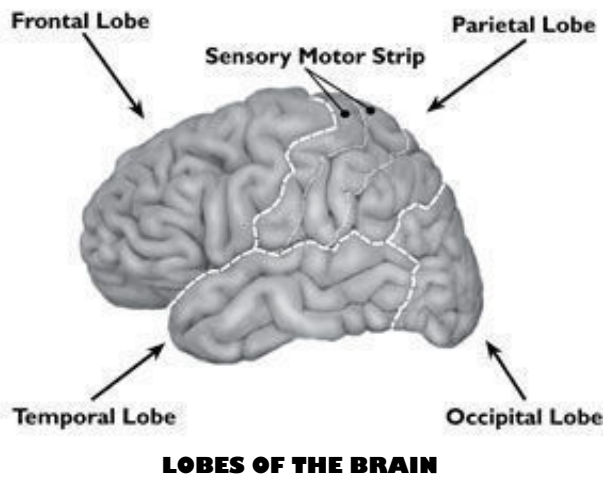
11. What could you do to correct the problem in #10?

The Research

Scientists know that the more pathways by which you take in information, the stronger the memory. Using more senses is called *multisensory experience* and involves more parts of the brain.

While the brain is very interconnected, certain parts of the brain have specialties. The brain has four major sections, called *lobes*. Vision is processed in the *occipital lobe*, near the back of your head. What you hear is processed in the *temporal lobe*, behind your ears. Speaking and writing involve movement—motor skills—and are processed in the *sensory motor strip* in the *parietal lobe*, near the top of your head. The fourth lobe, *frontal lobe*, is located behind your forehead. You will learn more about this in Week Four.

Activate multiple pathways for stronger learning!



Each of these lobes has pathways to other lobes. If you see words while you are listening to them, you are getting more activation in the occipital lobe as well as in the temporal lobe. If you say it or write it down, you are getting more activation in the parietal lobe. And if you *think* carefully about what you are reading or writing, you are getting activation in the frontal lobe.

The more pathways you can involve, the larger and stronger the network. Scientist Richard Mayer tested learners and found that the groups getting multisensory input remembered the material much better and the memory lasted longer—even up to 20 years! Research suggests that the more you elaborate on the material (using it in different ways and thinking more about it), the better the learning. Also, if you

Fire more pathways, and you can't access one of them well on the test, you may be able to access another pathway to recall the information.

So What?

I am sure it makes sense to you that if you use more than one sense—pathway—you would have a stronger memory based on what you learned in Week One. You know that you need to create strong neural networks and using more parts of your brain creates a larger network. If you can't remember what you *saw*, maybe you can think about what you *heard* and that would help bring the memory back. Maybe you can picture what you were writing or saying to someone. Each time you use a sense to work with the information, you are creating a stronger pathway.

Just Do This!

Take the information in using as many senses as possible. As you are reading it, say it. Write it down! Record yourself and listen in the car. Power up your learning with multiple pathways.

Reflect and Connect:

How many senses did you usually use to study? How will this information change your behavior?

The Research:

The famous scientist John Medina says that vision trumps everything! He believes that it is the best tool of all for learning!

Half of your brain’s resources are used by vision. Scientists know that vision is a very powerful tool for remembering. In fact, they call this the *pictorial superiority effect*, meaning that pictures are superior to words for remembering. Compared to reading words in a book, you can remember over six times more if you include a picture. Even pictures you imagine and don’t see with your eyes are seen with visual cortex in the brain and are just as powerful.

Instead of writing a thousand words, draw a picture!

So What?

If you play cards, you know that a trump card is the highest card in the game, no matter what. It’s the best card in your hand. Well, you have a trump card in your brain, and that is vision. You learn better and remember better with pictures, including illustrations, diagrams, charts, and maps. People throughout history have known this important fact and say “a picture is worth a thousand words.” So instead of writing a thousand words, or fifty words, draw a picture.

It is also important to *visualize* as you read. Try to picture what you are reading in your mind—create a mental image. If you are reading about someone doing something, picture the person doing it.

Drawing works with ideas and vocabulary words. It takes a great deal of effort to think of how to represent something with a drawing and to create the drawing, but after your brain does all that work, it is not likely to forget it.

Research for yourself which is easier to understand and remember—a picture or words? Here is a definition of *trestle* from Wikipedia:

A **trestle** is a rigid frame used as a support, especially referring to a bridge composed of a number of short spans supported by such frames.

I mean, can you even picture this, much less recall it? But if you go to Google Image and look up *trestle*, you will see pictures similar to the ones on the right.

If you look at 3 pictures, you will learn the meaning the way the brain prefers to learn, by seeing patterns. What do the three pictures have in common? Now you know what a trestle is. If you look at the pictures first, and then read the definition, the definition then makes sense. Draw it yourself and write the definition in your own words for powerful learning.



Just Do This!

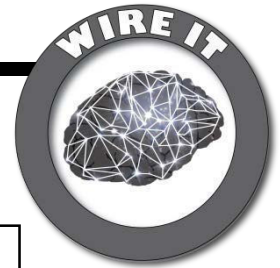
Use Google Image to look up vocabulary words. Use YouTube to watch videos of what you are studying. Take the time to sketch in the left hand column of your Smart Notes page. Try these and see the power of the *pictorial superiority effect*!

Reflect and Connect:

Do you usually look at the illustrations, pictures, charts or graphs in your textbooks? How can you use pictures to boost your memory?



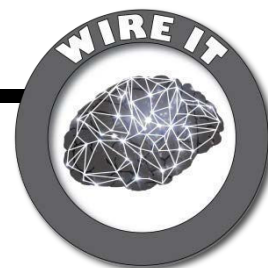
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1. Test your ability to recall and use images. Think back to Week 1 and draw two neurons connecting to each other. Label the neuron, axon, dendrite, and synapse.



2. Using a current assigned reading, make a mind map of the important facts. Do this on another sheet of paper. If you are not clear on how to do a mind map, go to Google Image and type in mind map to see examples or go to <http://www.wikihow.com/Make-a-Mind-Map> and see the process in 11 easy steps.
3. Pick one of the sample diagrams and fill it in using information from a current assignment. Draw it on another sheet of paper.
4. Select one of the subheadings in an assigned reading. Put the term in Google Image and see if you get a timeline, chart, illustration, or diagram. If so, select two that help you understand that topic and print them if you can. If you find helpful information, you would want to continue doing this with other subheadings in that chapter.
5. Using the Smart Notes page at the end of this chapter, take notes on an assigned reading. Use all the features available to you on the form. Be sure to include drawings and questions.
6. With another student in your class, take turns teaching each other the material. Break the material down by sections and spend 3–4 minutes per turn, taking as many turns as you have time.
7. Working with one or two other students in your class, compare notes. Rewrite your notes as you compare, adding anything you missed that someone else captured. Remember that you and others may write down unimportant or incorrect information, so think critically and discuss what should go into the final notes before you write it down.
8. Experiment with talking aloud while studying. See if reading aloud, saying some of the vocabulary and important ideas aloud, or thinking aloud about the material makes a difference. Research says it will help, but you won't know until you try!



1. How much total time did you spend studying for the test?

2. About how many of those hours were spent the day before or on the day of the test and how many were spent on days other than the day before/on? _____
3. About how many days *before* the test did you begin studying for the test? _____
4. Out of those days, how many days did you actually study for the test? _____
5. How many repetitions of the material did you provide yourself in preparation for the test? _____
6. How much of the assigned textbook material for this test did you read? $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ all
7. How many hours sleep did you get the night before the test? _____
8. How many times did you practice test for this test? _____
9. What memory strategies did you use to prepare for the test. Look at the chart of encoding strategies as a guideline to answer. _____

10. Did you take notes in class? Yes No If yes, how many times did you review them? _____
11. Did you go to a lab for extra help? _____
12. Did you use a study partner to prepare for the test? _____
13. How many days/classes did you miss during the time period of the last test to this test? _____

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