About Your Study Plan

This Study Plan is your syllabus for the American Board program. We encourage you to use the recomm ended resources to target preparation to your needs and goals.

There will be hyperlinks throughout this document. Please make sure that you visit the relevant pages to access all of the resources.

Your commitment to great teaching begins here. Your efforts will not only help you pass the test, but will also prepare you to become a successful teacher.

How to Study:

The American Board is committed to making sure you are the best possible teacher.

We will provide you with study tips to get ready for the exam and both the content and resources to review this material. It is your job to commit to preparing and stay dedicated while studying.

Think of the Snapshot below as an overview for what you need to know. For more detail in each topic, review the exam standards. The American Board exams are based on this blueprint, so consider this a syllabus for what you want to study.

Your Materials

Standards: a list of everything that might be on the test.
Study Plan: your syllabus with links to what you need to study for each section.
Study Materials: an overview course materials on topics you will be tested on.
Practice Exam/Section Quizzes: sample test questions and solutions.

General Science Exam Snapshot

Time Allowed	240 minutes	
Format	Multiple-choice	
Number of Questions	145	
On-Screen Exhibits (available as relevant)	Standard calculator; Periodic Table	
Passing Score	Proficient: 251 Distinguished: 320	(The number of questions answered correctly is converted to a scaled score ranging from 0 to 500.)
Exam Summary	**Content Domains**	**Approximate Percentage of Examination**
	Scientific Investigation	15%
	Biology	22%
	Chemistry	22%
	Earth Science	20%
	Physics	21%

ABOUT THIS EXAM

The American Board for Certification of Teacher Excellence believes that highly skilled general science teachers should possess a comprehensive body of scientific knowledge that is research-based and promotes student achievement. The general science exam is a rigorous assessment of a candidate's knowledge and application of general biology, chemistry, earth science, and physics concepts. The topics assessed are characteristically covered in introductory college science courses, although some more advanced questions are included, as teachers must hold a more sophisticated understanding of science content than that presented to their students.

All exhibits you will see on the Pearson Vue exam are identical to the exhibits displayed on the Practice Exams and Section Quizzes.

The Study Plan:
Your study plan includes direction on how to use the American Board's required resources. We also include recommended resources to aid in your mastery.

This plan was designed for a 9 month period (4 months for Professional Teaching Knowledge (PTK); 4 months for the subject matter; 2 weeks to take each test) in which most people are able to complete the program. Many have completed the program in a shorter amount of time. If you require additional time beyond your scheduled end date, the opportunity exists to purchase a six-month extension in the program.

BIOLOGY

		Recommended Resource	Timeline
Domains 1 and 2 (Standards 1.01-2.07) **These Standards cover:** ☐ Biochemical Basis of Life ☐ Cell Biology	Complete the following readings and watch the following videos in the General Study Materials (PDF or Online version) to learn the material to understand these standards: Biochemical Basis of Life ☐ Biochemical Basis of Life ☐ Lipids ☐ Proteins ☐ Nucleotides & Nucleic Acids ☐ Discovering Cells Cell Biology ☐ Prokaryotes ☐ Cells: Pieces & Parts ☐ A Little In and A Little Out ☐ Cellular Energetics ☐ Specialized Cells ☐ Eukaryotes ☐ Viruses	**Websites:** ☐ Biological Evolution ☐ Cell and Molecular Biology Online **Books:** ☐ Lehninger Principles of Biochemistry ☐ Schaum's Outline of Biochemistry ☐ Cells, Gels and the Engines of Life ☐ Dictionary of Cell Biology	{Time}

Your Notes:

Note: The recommended resources are often freely accessible online or can be found in your library. To ease your search, we have hyperlinked them.

Study Tip:
One effective way of using the practice quizzes is to look at the incorrect answer choices before looking at the correct explanation to see if you can understand why those options are wrong. If you can understand how a test maker uses distractors, you will be able to eliminate wrong answer choices faster on test day.

BIOLOGY

Area of Study	Required Resource	Recommended Resource	Timeline
Domains 3 and 4 **(Standards 3.01-4.11)** **These Standards cover:** ☐ Biology- Classical Genetics and Molecular Biology ☐ Biology- Evolution	Complete the following readings and watch the following videos in the General Study Materials (PDF or Online version) to learn the material to understand these standards: **Genetics and Molecular Biology** ☐ Classical Genetics ☐ DNA and RNA Replication ☐ DNA: Genetic Storage ☐ Gene Regulation **Evolution** ☐ Evolution ☐ Speciation	**Websites:** ☐ Beginner's Guide to Molecular Biology: Molecular Biology Notebook Online ☐ Biological Evolution **Books:** ☐ DNA: The Secret of Life ☐ Origin of Species ☐ The Complete Idiot's Guide to Biology	{Time}

Your Notes:

"I can give children the inspiration and encouragement to confront their own challenges, surpass negativity and persevere....Without this program, I wouldn't have had the opportunity to pursue teaching."

–Traci Brown, ABCTE Teacher, FL

Testing on the Computer:

This may be your first time taking a test on a computer. On average, people read 20% slower on a screen vs. paper. Because of this and other issues, practice as much as you can on the computer to become comfortable working in that environment.

Familiarity with the test and its standards will go a long way towards your success.

The online practice tests are great practice to get a feel for the testing environment.

BIOLOGY

Area of Study	Required Resource	Recommended Resource	Timeline
Domains 5, 6, and 7 (Standards 5.01-7.12) **These Standards cover:** ☐ Biology- Animal Physiology ☐ Biology- Plant Physiology ☐ Ecology	Complete the following readings and watch the following videos in the General Science Study Materials (PDF or Online version) to learn the material to understand these standards: Animal Physiology ☐ Organization - from cells to organ system ☐ Organ Systems ☐ Organ Systems II Plant Physiology ☐ Plants ☐ Plant Growth Ecology ☐ Ecology ☐ Ecological Growth and Limits ☐ Environmental Cycles	Websites: ☐ The Journal of General Physiology ☐ Plant Physiology Books: ☐ Physiology ☐ Plants and Microclimate: A Quantitative Approach to Plant Physiology ☐ The Concept of the Ecosystem ☐ Ecology.com	{Time}

Your Notes:

"The information presented in the courses and the workshops was extremely helpful to me because they provided real examples that I have been able to implement immediately in my classroom."

–Lauren Masino, ABCTE Teacher, FL

GENERAL SCIENCE EXAM STUDY PLAN

We love to highlight American Board teachers in local newspapers. Not only does this provide publicity for a potential job search, it can also help highlight your school as one that is committed to providing students with the best possible teacher. Visit https://www.americanboard.org/share-your-story/

CHEMISTRY

Area of Study	Required Resource	Recommended Resource	Timeline
Domains 8 and 9 **(Standards 8.01-9.01)** **These Standards cover:** ☐ **Chemistry- Periodic Table and Trends** ☐ **Chemistry- Quantum Mechanics**	Complete the following readings and watch the following videos in the General Science Study Materials (PDF or Online version) to learn the material to understand these standards: Periodic Table ☐ **Tools of the Trade: the Periodic Table** **Quantum Mechanics** ☐ **Quantum Mechanics - Electron configurations and orbital diagrams**	**Websites:** ☐ WebElements ☐ Quantum Mechanics **Books:** ☐ A Well-Ordered Thing: Dmitrii Mendeleev and the Shadow of the Periodic Table ☐ The Cartoon Guide to Chemistry ☐ Introduction to Quantum Mechanics ☐ Schaum's Outline of Quantum Mechanics ☐ What Is Quantum Mechanics?: A Physics Adventure	{Time}

Your Notes:

Study Tip: Use a science survey text

A basic survey text on chemistry like The Cartoon Guide to Chemistry or the Idiot's Guide to Chemistry is recommended as a starting point. If you have another survey book from college, or you have access to a different text from your library, that is perfectly fine. It is important that you have access to a survey book because it will assist in covering the various domains of the exam.

Study Tip: Websites like Wikipedia and other unverified sources of information are *NOT* a good source of study. Much information found on the World Wide Web consists of unverified sources. Stick to verified sources with full citations. Many resources selected for study by our experts can be found on ABCTE's resource pages.

CHEMISTRY

Area of Study	Required Resource	Recommended Resource	Timeline
Domains 10 and 11 (Standards 10.01-11.01) These Standards cover: ☐ Chemistry- Molecular Bonding and Structure ☐ Chemistry- Chemical Naming and Formulas	**Complete the following readings and watch the following videos in the General Science Study Materials (PDF or Online version) to learn the material to understand these standards:** **Molecular Bonding and Structure** ☐ Bonding and Atomic Structure ☐ Physical Chemistry **Chemical Naming and Formulas** ☐ Formulae and Naming Compounds	Websites: ☐ Organic Chemistry Online ☐ Chemical Formulas Review Books: ☐ Structure and Bonding ☐ Introductory Chemistry ☐ The Complete Idiot's Guide to Chemistry	{Time}

Your Notes:

Exam Tip: When questions seem to have more than one right answer, it is likely that you are not catching a distractor. In your practice, see if your first instinct tends to give you the right answer. More often than not, it does if you have studied well. On test day, when you get stuck you can rely on your gut and move on without using up too much time. This is true for the "Best" question type as well. More than one answer may seem correct, but the right answer will not need an extra step.

Spread the Word: Though many people talk about teaching as a second career, few people act on it and make a difference. Whether it is finding the means or the courage to take the first step in choosing a path, many people don't know a program like ABCTE even exists to simplify the process. The power of your actions can be the inspiration for the beginning of a career for friends or family.

CHEMISTRY

Area of Study	Required Resource	Recommended Resource	Timeline
Domains 12 and 13 (Standards 12.01-13.01) **These Standards cover:** ☐ Chemistry- Chemical Reactions and Stoichiometry ☐ Chemistry- Electrochemistry	Complete the following readings and watch the following videos in the General Science Study Materials (PDF or Online version) to learn the material to understand these standards: **Chemical Reactions and Stoichiometry** ☐ Reactions and Stoichiometry ☐ Reaction Rates **Electrochemistry** ☐ Oxidation and Reduction	**Websites:** ☐ Stoichiometry and Balancing Chemical Equations ☐ Electrochemistry **Books:** ☐ Chemical Kinetics and Reaction Dynamics ☐ Fundamentals of Chemical Reaction Engineering ☐ Analytical Electrochemistry ☐ Modern Electrochemistry 1: Ionics ☐ Modern Electrochemistry 2A: Fundamentals of Electrodics	{Time}

Your Notes:

Study Tip: When you see an unfamiliar concept in the standards a good place to start is your survey text. Go to the index and look for the unknown person or term.

Test Day Tip: Familiarity with the exam is one of the most important ways to get prepared. Start with the standards and the domains and make sure to study hard, but don't underestimate the importance of being familiar with test day. Visit your testing location before you have to test. Know what to expect by way of writing boards, computers, and waiting rooms. Realize that there will be administrative parts of the test you will have to complete in addition to the exam itself.

CHEMISTRY

Area of Study	Required Resource	Recommended Resource	Timeline
Domains 14, 15, and 16 (Standards 14.01-16.02) **These Standards cover:** ☐ Chemistry- Solution Chemistry ☐ Chemistry- Gas Laws ☐ Chemistry- Nuclear Chemistry	Complete the following readings and watch the following videos in the General Science Study Materials (PDF or Online version) to learn the material to understand these standards: Solution Chemistry ☐ Solutions Gas Laws ☐ Gas Laws, Ideal Gas, and Kinetic Molecular Theory Nuclear Chemistry ☐ Nuclear Fission and Fusion	Websites: ☐ Gas Laws Books: ☐ Chemical Kinetics: The Study of Reaction Rates in Solution ☐ Chemistry: Concepts and Problems: A Self-Teaching Guide ☐ Chemistry for Dummies ☐ Molecular Collision Theory	{Time}

Your Notes:

Every resource the American Board provided was helpful in gaining the knowledge needed to succeed as a teacher. The refresher courses were well organized and easy to follow and the personal mentor I was provided with really helped me plot a course for success as a teacher.

- Mark Peniston, FL

Test Day Tip: Did you know that the most important night to get a good night's sleep is not the night before but rather two nights before your exam? If you have ever pulled an all nighter, you will remember feeling pretty good the next day, though you end up falling asleep early. Get plenty of rest and take care of yourself the entire week for your exam.

EARTH SCIENCE

Area of Study	Required Resource	Recommended Resource	Timeline
Domains 17, 18, and 19 (Standards 17.01-19.15) **These Standards cover:** ☐ Earth Science- Astronomy and Cosmology ☐ Earth Science- Structure and Composition of Earth ☐ Earth Science- Earth's Magnetic Fields, Plate Tectonics and Structural Geology	Complete the following readings and watch the following videos in the General Science Study Materials (PDF or Online version) to learn the material to understand these standards: Astronomy and Cosmology ☐ Astronomy and Cosmology Structure and Composition of Earth ☐ Earth Structures and Composition Magnetic Fields, Plate Tectonics and Structural Geology ☐ Magnetic Field, Plate Tectonics and Structural Geology	Websites: ☐ Cosmology and Astronomy ☐ A Plate Tectonic Primer ☐ Plate Tectonics ☐ The Earth's Magnetic Field Books: ☐ Astronomy for Dummies ☐ An Introduction to the Science of Cosmology ☐ Earth Science ☐ Earth Magnetism: A Guided Tour through Magnetic Fields ☐ Plate Tectonics and Crustal Evolution	{Time}

Your Notes:

Test Day Tip: Exam Familiarity – Did you know that your clock starts the moment you start the test? That means reading the instructions is art of the timed test. Knowing what the instructions say before you go into the testing center gives you a slight advantage. That way you simply skim through the instructions for any surprises and then get right into the exam.

Test Day Tip: Don't underestimate nutrition and fitness when taking standardized tests! This a four hour event and much like sporting events, it is necessary to eat right, hydrate well, and manage your energy. You want to avoid sugars; instead jumpstart your brain with a carbohydrate like toast or a bagel and follow with a protein for long term energy. Fruits or energy bars are good snacks but avoid stimulants if possible.

EARTH SCIENCE

Area of Study	Required Resource	Recommended Resource	Timeline
Domains 20, 21, 22, and 23 (Standards 20.01-23.06) These Standards cover: ☐ Earth Science- History of the Earth ☐ Earth Science- Earth's Atmosphere ☐ Earth Science- Earth's Water ☐ Earth Science- Earth's Resources and ☐ Hazards	Complete the following readings and watch the following videos in the General Science Study Materials (PDF or Online version) to learn the material to understand these standards: History of the Earth ☐ The History of the Earth Earth's Atmosphere ☐ The Atmosphere–An Ocean of Air ☐ A Short History of the Atmosphere ☐ The Layers of the Atmosphere ☐ Measuring & Forecasting the Weather ☐ Clouds & Weather ☐ Solar Radiation & the Atmosphere Earth's Water ☐ The Earth's Water ☐ Water on the Move ☐ The Oceans Earth's Resources and Hazards ☐ Resources & Hazards	Websites: ☐ Ocean World ☐ Water Science for Schools ☐ Environmental News Network Books: ☐ A Short History of Planet Earth: Mountains, Mammals, Fire, and Ice ☐ Earth: An Intimate History ☐ Atmospheric Pollution ☐ National Audubon Society Field Guide to North American Weather ☐ The USA Today Weather Book: An Easy-To-Understand Guide to the USA's Weather ☐ Essentials of Oceanography ☐ Glaciers and Glaciation ☐ Environmental Science: Toward a Sustainable Future	{Time}

Your Notes:

Study Tip: Use a science survey text

A basic survey text like The Cartoon Guide to Physics or The Complete Idiot's guide to Physics is recommended as a starting point. If you have another survey book from college, or you have access to a different text from your library, that is perfectly fine. It is important that you have access to a survey book because it will assist in covering the various domains of the exam.

PHYSICS

Area of Study	Required Resource	Recommended Resource	Timeline
Domains 24, 25, and 26 (Standards 24.01-26.04) **These Standards cover:** ☐ Physics- General Mathematics and Kinematics ☐ Physics- Dynamics ☐ Physics- Work Energy Power and Momentum	Complete the following readings and watch the following videos in the General Science Study Materials (PDF or Online version) to learn the material to understand these standards: ☐ Work, Energy, Power, & Momentum	Websites: ☐ Easyphysics.net ☐ Mechanics, Kinematics ☐ Plus2Physics ☐ Physics - Dynamics ☐ The Physics Classroom ☐ Momentum, Work and Energy ☐ Hyperphysics Books: ☐ Physics Demystified : A Self-Teaching Guide ☐ How Things Work: The Physics of Everyday Life ☐ Concepts of Force: A Study in the Foundations of Dynamics ☐ Engineering Mechanics, Dynamics ☐ The Complete Idiot's Guide to Physics	{Time}

Your Notes:

Resource Tip: Though the Candidate Services staff are not a tutor, he or she are there to answer questions on how the program works and direct you to resources to aid in your studying. Candidate Service's job is to help you and hundreds of other candidates make it through the program. A member of the Candidate Services staff will take your questions when you call in, but if your question requires more discussion, they may book an appointment with you.

Test Day Tip: Hydration – Did you know Gatorade has the same osmolarity as blood? That means it has the same concentration of salts and electrolytes and it makes it easier to absorb. It also means you go to the bathroom less than if you drink water.

PHYSICS

Area of Study	Required Resource	Recommended Resource	Timeline
Domains 27, 28, and 29 (Standards 27.01-29.07) These Standards cover: ☐ Physics- Mechanics of Fluids ☐ Physics- Thermodynamics ☐ Physics- Waves	Complete the following readings and watch the following videos in the General Science Refresher Course (PDF or Online version) to learn the material to understand these standards: Fluids ☐ Mechanics of Fluids Thermodynamics ☐ Thermodynamics Waves ☐ Mechanical Waves	Websites: ☐ Fluid Mechanics ☐ Waves ☐ Thermodynamics and Thermal Physics ☐ Mechanical Waves Books: ☐ Waves in Fluids ☐ Mechanics of Fluids ☐ Schaum Engineering Thermodynamics ☐ Thermodynamics ☐ Cymatics: A Study of Wave Phenomena and Vibration ☐ Linear and Nonlinear Waves ☐ The Cartoon Guide to Physics	{Time}

Your Notes:

Test Day Tip: In case of an incident on test day, like a blackout, or computer failure, do not despair!, Report the incident immediately to the Pearson VUE test center personnel and then after the exam, contact Candidate Services. Minor incidents may not be considered problematic so continue the test to the best of your ability.

PHYSICS

Area of Study	Required Resource	Recommended Resource	Timeline
Domains 30, 31, and 32 (Standards 30.01-32.11) These Standards cover: ☐ Physics- Electricity ☐ Physics- Magnetism and Electromagnetism ☐ Physics- Optics	Complete the following readings and watch the following videos in the General Science Study Materials (PDF or Online version) to learn the material to understand these standards: Electricity ☐ Electricity Magnetism and Electromagnetism ☐ Magnetism & Electromagnetism Optics ☐ Optics	Websites: ☐ Electricity and Magnetism ☐ What is Static Electricity? ☐ Electricity and Magnetism ☐ Atmospheric Optics Books: ☐ Basic Electricity ☐ Delmar's Standard Textbook of Electricity ☐ Classical Electricity and Magnetism: Second Edition ☐ Treatise on Electricity and Magnetism, Vol. 2 ☐ Introduction to Modern Optics ☐ Optics ☐ Principles of Optics: Electromagnetic Theory of Propagation, Interference and Diffraction of Light	{Time}

Your Notes:

The right way to get started: using the Standards as your syllabus

Your Self Assessment is a summary of the standards; by doing it, you have identified which ones need the most attention. The Standards are your study lifeline; you can find them on your MyAccount page. Throughout the course of your study you will learn all of them. How to begin? Here is American Board's Standards Stepwise method:

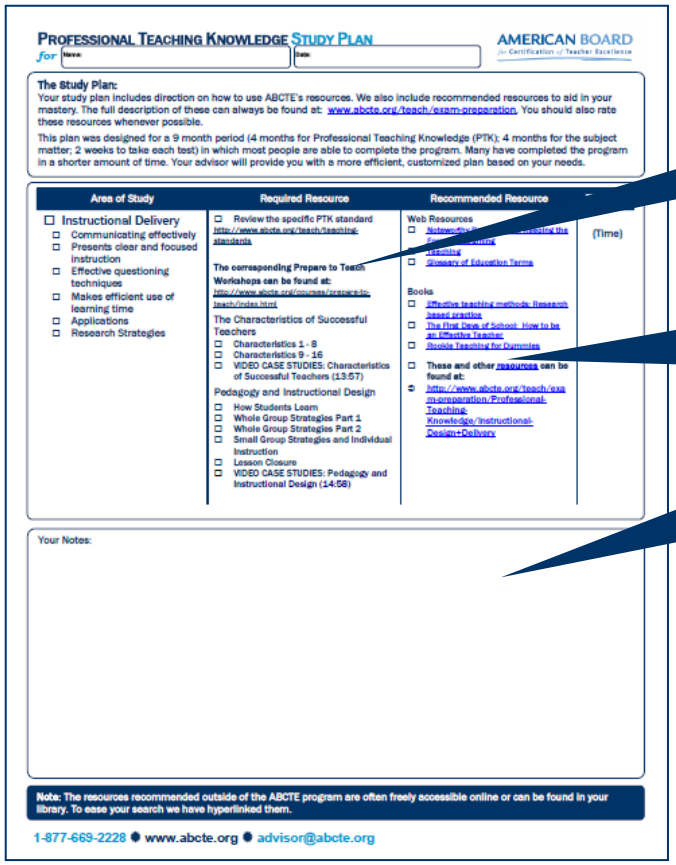
❶ Approach in bite-sized chunks: don't be overwhelmed or paralyzed by how many standards there are, simply pick a topic of a domain and get started.

❷ Define the terms: take the first **three items** in the topic and make sure you know all the terms. Look up any you are do not recognize. After all, you cannot answer a question definitively if you don't even know the terms.

Domain 1: Instructional Design

Topic 1: Selects, Organizes, Plans, and Designs Content

1.1.01	Writes measurable objectives for both individual or classroom performance based on student data and subject matter.
1.1.02	Guides curricular planning (e.g., content clusters, instructional methods, learning activities and assessment tools) based on goals of the instruction.
	…entral concepts,
	…ination to
1.1.05	Juxtaposes examples that differ in many ways but are the same in defining features, so that students can generalize to new examples and learn to discriminate same/different when faced with new examples.
1.1.06	Plans lessons, depending on size and content of unit, so that important ideas or skills are st… …everal occasions rather than all
1.1.07	Selects lesso…



PROFESSIONAL TEACHING KNOWLEDGE STUDY PLAN

for [Name] [Date]

AMERICAN BOARD for Certification of Teacher Excellence

The Study Plan:

Your study plan includes direction on how to use ABCTE's resources. We also include recommended resources to aid in your mastery. The full description of these can always be found at: www.abcte.org/teach/exam-preparation. You should also rate these resources whenever possible.

This plan was designed for a 9 month period (4 months for Professional Teaching Knowledge (PTK); 4 months for the subject matter; 2 weeks to take each test) in which most people are able to complete the program. Many have completed the program in a shorter amount of time. Your advisor will provide you with a more efficient, customized plan based on your needs.

Area of Study	Required Resource	Recommended Resource	
☐ Instructional Delivery ☐ Communicating effectively ☐ Presents clear and focused instruction ☐ Effective questioning techniques ☐ Makes efficient use of learning time ☐ Applications ☐ Research Strategies	☐ Review the specific PTK standard http://www.abcte.org/teach/teaching-standards The corresponding Prepare to Teach Workshops can be found at: http://www.abcte.org/courses/prepare-to-teach/index.html The Characteristics of Successful Teachers ☐ Characteristics 1 - 8 ☐ Characteristics 9 - 16 ☐ VIDEO CASE STUDIES: Characteristics of Successful Teachers (13:57) Pedagogy and Instructional Design ☐ How Students Learn ☐ Whole Group Strategies Part 1 ☐ Whole Group Strategies Part 2 ☐ Small Group Strategies and Individual Instruction ☐ Lesson Closure ☐ VIDEO CASE STUDIES: Pedagogy and Instructional Design (14:58)	Web Resources ☐ Notewo… …ding the Standards ☐ …rgeting ☐ Glossary of Education Terms Books ☐ Effective teaching methods: Research based practice ☐ The First Days of School: How to be an Effective Teacher ☐ Books Teaching for Dummies ☐ These and other resources can be found at: http://www.abcte.org/teach/exam-preparation/Professional-Teaching-Knowledge/Instructional-Design+Delivery	(Time)

Your Notes:

Note: The resources recommended outside of the ABCTE program are often freely accessible online or can be found in your library. To ease your search we have hyperlinked them.

1-877-669-2228 ● www.abcte.org ● advisor@abcte.org

❸ Use the required resources in your Study Plan or a broad survey text to refresh your memory on the topic.

❹ Use the appropriate recommended resources to probe deeper if you need better understanding. Use the Standards to target the sections you need to read.

❺ Your Notes: identify additional resources to help you prepare for the exam.

❻ Check for understanding and reflect: think about how you would use this in a classroom or how you would teach the subject. Use your quizzes to check for understanding and move on.

❼ Wash, rinse, and repeat: once you finish a chunk of three, go back and attack the next three.

Have a Plan

It is important to have a plan of attack to study. Block out set times to study and if you slip and miss a session, restart your plan instead of letting yourself get paralyzed and procrastinate.

AMERICANBOARD

Your Community. Your Teachers.