

Algebra 2 Unit 12: Statistical Notes

Variability and Sampling

Data is everywhere. In its raw form, pages, it's in our science classes, it shows up in economics, statistics and anywhere else that variability occurs. Variability is simply the property of outcomes being different. The tools of statistics are designed to explain this variability. There are many types of variability. It is good to understand these various in order to understand their origin, how we measure variability.

Example 1 The following types of variability can change variability of a data set. For each, give an example that may hold.

- (a) **Observational or Measurement Variability:** Variability that is introduced due to either our measuring instruments and being present enough to distinguish as have two different people read the measurement.

2 students measure time for a ball to roll down a ramp
→ different reaction times

- (b) **Natural Variability or Inherent Individual Variability:** Variability that occurs due to the fact that members of populations are simply different.

2 people work out same amount of time
→ different people use different amounts of weight

- (c) **Random Variability:** This type of variability is the result of noise and error. It can be because our tools assigned our populations or samples to two or more treatment groups and then observing the variability between the groups.

2 groups taking a test, one group allowed to sleep 8 hours, other group only 4 hours → different scores

- (d) **Sample Variability:** This is the type of variability that occurs when we take multiple samples. There is population variability. There is going to still be difference due to the variability of the samples or means.

Multiple samples of people surveyed to determine political candidate preference.

Remember, through all of our work in this book, we are really trying to explain the variability of data within either a population or a sample and then using this to determine if the variability was the introduced to one of the factors chosen or the variability of the others.

Emathinstruction Answer Key Unit 5

Patrick Vollmar



Emathinstruction Answer Key Unit 5:

If you ally obsession such a referred **Emathinstruction Answer Key Unit 5** ebook that will come up with the money for you worth, get the agreed best seller from us currently from several preferred authors. If you want to funny books, lots of novels, tale, jokes, and more fictions collections are plus launched, from best seller to one of the most current released.

You may not be perplexed to enjoy all books collections Emathinstruction Answer Key Unit 5 that we will categorically offer. It is not around the costs. Its more or less what you infatuation currently. This Emathinstruction Answer Key Unit 5, as one of the most vigorous sellers here will categorically be in the midst of the best options to review.

https://staging.conocer.cide.edu/files/browse/fetch.php/Id9calculator_User_Guide.pdf

Table of Contents Emathinstruction Answer Key Unit 5

1. Understanding the eBook Emathinstruction Answer Key Unit 5
 - The Rise of Digital Reading Emathinstruction Answer Key Unit 5
 - Advantages of eBooks Over Traditional Books
2. Identifying Emathinstruction Answer Key Unit 5
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Emathinstruction Answer Key Unit 5
 - User-Friendly Interface
4. Exploring eBook Recommendations from Emathinstruction Answer Key Unit 5
 - Personalized Recommendations
 - Emathinstruction Answer Key Unit 5 User Reviews and Ratings
 - Emathinstruction Answer Key Unit 5 and Bestseller Lists
5. Accessing Emathinstruction Answer Key Unit 5 Free and Paid eBooks

- Emathinstruction Answer Key Unit 5 Public Domain eBooks
- Emathinstruction Answer Key Unit 5 eBook Subscription Services
- Emathinstruction Answer Key Unit 5 Budget-Friendly Options
- 6. Navigating Emathinstruction Answer Key Unit 5 eBook Formats
 - ePub, PDF, MOBI, and More
 - Emathinstruction Answer Key Unit 5 Compatibility with Devices
 - Emathinstruction Answer Key Unit 5 Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Emathinstruction Answer Key Unit 5
 - Highlighting and Note-Taking Emathinstruction Answer Key Unit 5
 - Interactive Elements Emathinstruction Answer Key Unit 5
- 8. Staying Engaged with Emathinstruction Answer Key Unit 5
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Emathinstruction Answer Key Unit 5
- 9. Balancing eBooks and Physical Books Emathinstruction Answer Key Unit 5
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Emathinstruction Answer Key Unit 5
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Emathinstruction Answer Key Unit 5
 - Setting Reading Goals Emathinstruction Answer Key Unit 5
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Emathinstruction Answer Key Unit 5
 - Fact-Checking eBook Content of Emathinstruction Answer Key Unit 5
 - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development

- Exploring Educational eBooks

14. Embracing eBook Trends

- Integration of Multimedia Elements
- Interactive and Gamified eBooks

Emathinstruction Answer Key Unit 5 Introduction

In this digital age, the convenience of accessing information at our fingertips has become a necessity. Whether its research papers, eBooks, or user manuals, PDF files have become the preferred format for sharing and reading documents. However, the cost associated with purchasing PDF files can sometimes be a barrier for many individuals and organizations. Thankfully, there are numerous websites and platforms that allow users to download free PDF files legally. In this article, we will explore some of the best platforms to download free PDFs. One of the most popular platforms to download free PDF files is Project Gutenberg. This online library offers over 60,000 free eBooks that are in the public domain. From classic literature to historical documents, Project Gutenberg provides a wide range of PDF files that can be downloaded and enjoyed on various devices. The website is user-friendly and allows users to search for specific titles or browse through different categories. Another reliable platform for downloading Emathinstruction Answer Key Unit 5 free PDF files is Open Library. With its vast collection of over 1 million eBooks, Open Library has something for every reader. The website offers a seamless experience by providing options to borrow or download PDF files. Users simply need to create a free account to access this treasure trove of knowledge. Open Library also allows users to contribute by uploading and sharing their own PDF files, making it a collaborative platform for book enthusiasts. For those interested in academic resources, there are websites dedicated to providing free PDFs of research papers and scientific articles. One such website is Academia.edu, which allows researchers and scholars to share their work with a global audience. Users can download PDF files of research papers, theses, and dissertations covering a wide range of subjects. Academia.edu also provides a platform for discussions and networking within the academic community. When it comes to downloading Emathinstruction Answer Key Unit 5 free PDF files of magazines, brochures, and catalogs, Issuu is a popular choice. This digital publishing platform hosts a vast collection of publications from around the world. Users can search for specific titles or explore various categories and genres. Issuu offers a seamless reading experience with its user-friendly interface and allows users to download PDF files for offline reading. Apart from dedicated platforms, search engines also play a crucial role in finding free PDF files. Google, for instance, has an advanced search feature that allows users to filter results by file type. By specifying the file type as "PDF," users can find websites that offer free PDF downloads on a specific topic. While downloading Emathinstruction Answer Key Unit 5 free PDF files is convenient, its important to note that copyright laws must be respected. Always ensure that the PDF files you download are

legally available for free. Many authors and publishers voluntarily provide free PDF versions of their work, but its essential to be cautious and verify the authenticity of the source before downloading Emathinstruction Answer Key Unit 5. In conclusion, the internet offers numerous platforms and websites that allow users to download free PDF files legally. Whether its classic literature, research papers, or magazines, there is something for everyone. The platforms mentioned in this article, such as Project Gutenberg, Open Library, Academia.edu, and Issuu, provide access to a vast collection of PDF files. However, users should always be cautious and verify the legality of the source before downloading Emathinstruction Answer Key Unit 5 any PDF files. With these platforms, the world of PDF downloads is just a click away.

FAQs About Emathinstruction Answer Key Unit 5 Books

How do I know which eBook platform is the best for me? Finding the best eBook platform depends on your reading preferences and device compatibility. Research different platforms, read user reviews, and explore their features before making a choice. Are free eBooks of good quality? Yes, many reputable platforms offer high-quality free eBooks, including classics and public domain works. However, make sure to verify the source to ensure the eBook credibility. Can I read eBooks without an eReader? Absolutely! Most eBook platforms offer web-based readers or mobile apps that allow you to read eBooks on your computer, tablet, or smartphone. How do I avoid digital eye strain while reading eBooks? To prevent digital eye strain, take regular breaks, adjust the font size and background color, and ensure proper lighting while reading eBooks. What the advantage of interactive eBooks? Interactive eBooks incorporate multimedia elements, quizzes, and activities, enhancing the reader engagement and providing a more immersive learning experience. Emathinstruction Answer Key Unit 5 is one of the best book in our library for free trial. We provide copy of Emathinstruction Answer Key Unit 5 in digital format, so the resources that you find are reliable. There are also many Ebooks of related with Emathinstruction Answer Key Unit 5. Where to download Emathinstruction Answer Key Unit 5 online for free? Are you looking for Emathinstruction Answer Key Unit 5 PDF? This is definitely going to save you time and cash in something you should think about.

Find Emathinstruction Answer Key Unit 5 :

id9calculator user guide

identity crisis joy luck club essay

ifrs multiple choice questions and answe

idylis 416709 instruction manual

ideacuttee ditineacuteraire la route celtique en nouvelleecosse

igcse biology paper 4

if you like to laugh volume one english edition

igcse business studies past papers 2013

idm g5 drive manual

ieee base paper graphical password

ielts sample test papers

igcse business october november paper 2 2013

ict suggetion hsc

ideacution build highly effective teams that get things done

ict gcse ccea

Emathinstruction Answer Key Unit 5 :

introduction to classical mechanics arya solutions manual ams - Jun 23 2022

web introduction to classical mechanics arya solutions manual 3 3 concepts and questions of considerable difficulty and breadth without painstaking calculation the software allows users to imagine speculate and ask what if and

classical mechanics with introduction to nonlinear oscillations - Apr 02 2023

web classical mechanics with introduction to nonlinear oscillations and chaos authors v b bhatia isbn 978 81 7319 105 3

publication year 1997 pages 365 binding hard back about the book the book covers the traditional classical mechanics and then introduces nonlinear oscillations and chaos

introduction to classical mechanics atam p arya solutions copy - Sep 26 2022

web introduction to classical mechanics atam p arya solutions 3 3 and graphs and generally provide more in depth coverage and a better understanding of physics pays special attention to such topics of modern interest as nonlinear oscillators central force motion collisions in cmcs and

classical mechanics google books - Sep 07 2023

web classical mechanics with introduction to nonlinear oscillations and chaos v b bhatia alpha science int l ltd 1997 chaotic behavior in systems 355 pages the book covers the

classical mechanics v b bhatia bok 9788173191053 bokus - Dec 30 2022

web pris 559 kr inbunden 2001 tillfälligt slut bevaka classical mechanics så får du ett mejl när boken går att köpa igen

classical mechanics with introduction to nonlinear oscillations - Mar 21 2022

web classical mechanics with introduction to nonlinear oscillations and chaos v b bhatia cessna model 421c golden eagle illustrated parts catalog 1976 thru 1985 hygiene beauty hair dryer electric toothbrush razor and hair trimmer hair straightener etc addtron technology 9258 switch user manual top laundry appliance brands kenmore

classical mechanics physics britannica - May 23 2022

web in classical mechanics the behaviour of a dynamical system can be described geometrically as motion on an attractor the mathematics of classical mechanics effectively recognized three types of attractor single points characterizing steady states closed loops periodic cycles and tori combinations of several cycles

classical mechanics wikipedia - Oct 28 2022

web classical mechanics is a theory useful for the study of the motion of non quantum mechanical low energy particles in weak gravitational fields also it has been extended into the complex domain where complex classical mechanics exhibits behaviors very similar to quantum mechanics branches

welcome to narosa publishing house - May 03 2023

web classical mechanics with introduction to nonlinear oscillations and chaos author s v b bhatia isbn 978 81 7319 104 6 e isbn publication year 1997 pages 365 binding paper back dimension 155mm x 230mm weight 400 textbook

classical mechanics bangla pdf scribd - Apr 21 2022

web carmen maria machado from everand the constant gardener a novel john le carre classical mechanics bangla free ebook download as pdf file pdf or read book online for free a m harun ar rashid

classical mechanics by v b bhatia open library - Aug 06 2023

web mar 1 1997 classical mechanics by v b bhatia march 1 1997 narosa pub house edition hardcover in english

classical mechanics problems and solutions - Jan 31 2023

web 4 classical mechanics problems and solutions 2020 10 10 additional collection of test problems and solutions available to qualifying university instructors written for graduate and advanced undergraduate students the goal of this series is to provide readers with a knowledge base necessary for

classical mechanics a course of lectures raychaudhuri a k - Jul 05 2023

web classical mechanics a course of lectures by raychaudhuri a k publication date 1983 topics mechanics publisher calcutta oxford university press

classical mechanics with introduction by bhatia v b - Jun 04 2023

web amazon in buy classical mechanics with introduction to nonlinear oscillations and chaos book online at best prices in india on amazon in read classical mechanics with introduction to nonlinear oscillations and chaos book reviews author details and more at amazon in free delivery on qualified orders

[classical mechanics atam arya solutions](#) - Jul 25 2022

web this comprehensive book on classical mechanics bridges the gap between introductory physics and quantum mechanics statistical mechanics and optics giving readers a strong basis for their work

[classical mechanics bhatia sibole online](#) - Feb 17 2022

web to get started finding classical mechanics bhatia you are right to find our website which has a comprehensive collection of manuals listed our library is the biggest of these that have literally hundreds of thousands of different products represented

classical mechanics v b bhatia google books - Oct 08 2023

web classical mechanics author v b bhatia publisher narosa publishing house 1997 isbn 8173191042 9788173191046 length 355 pages export citation bibtex

[loading interface goodreads](#) - Aug 26 2022

web discover and share books you love on goodreads

classical mechanics with introduction to nonlinear oscillations - Mar 01 2023

web mar 1 1997 tldr this thesis overviews crucial concepts involved in achieving quadcopters flight such as orientation estimation and control system implementation and presents researchers with comprehensive hardware and software specifications for a quadcopter system expand

[vb bhatia 1 pdf nonlinear system equations scribd](#) - Nov 28 2022

web here the system is classical its motion is governed by the laws of classical mechanics and is therefore completely deterministic and yet its long term behaviour is chaotic the phenomenon of chaos in classical systems is therefore called deterministic chaos

whatsapp backgrounds for nokia 201 pdf pdf voto uneal edu - Mar 29 2022

web whatsapp for nokia free download nokia suite whatsapp messenger whatsapp web and many more programs

whatsapp backgrounds for nokia 201 pdf download - Jun 12 2023

web you could buy lead whatsapp backgrounds for nokia asha 201 or get it as soon as feasible you could quickly download this whatsapp backgrounds for nokia asha 201

whatsapp backgrounds for nokia asha 201 pdf book - Aug 02 2022

web apr 30 2023 whatsapp backgrounds for nokia 201 pdf this is likewise one of the factors by obtaining the soft documents of this whatsapp backgrounds for nokia 201 pdf by

whatsapp backgrounds for nokia asha 201 - Oct 24 2021

watsapp backgrounds for nokia 201 pdf 2023 - Jan 27 2022

web out a ebook whatsapp backgrounds for nokia asha 201 with it is not directly done you could recognize even more nearly this life around the world we offer you this proper as

whatsapp background for nokia asha 201 bespoke cityam com - Nov 05 2022

web as this whatsapp backgrounds for nokia asha 201 pdf it ends happening inborn one of the favored book whatsapp backgrounds for nokia asha 201 pdf collections that we

whatsappbackgroundsfornokiaasha201 full pdf class neetprep - May 31 2022

web whatsapp backgrounds for nokia asha 201 huawei goes global may 12 2023 huawei goes global provides a much needed comprehensive and scholarly examination of the

whatsapp wallpapers wallpaper cave - Jan 07 2023

web april 29th 2018 whatsapp backgrounds for nokia 201 pdf whatsapp backgrounds for nokia 201 download wed 25 1 3 whatsapp backgrounds

[free whatsapp backgrounds for nokia asha 201](#) - Feb 25 2022

web version download whatsapp for nokia whatsapp backgrounds for nokia asha 201 download whatsapp messenger whatsapp for nokia 201 pdf download epaper

watsapp backgrounds for nokia 201 newsletter lufo lu se - Oct 04 2022

web whatsapp background for nokia asha 201 unveiling the power of verbal art an mental sojourn through whatsapp background for nokia asha 201 in a world inundated with

whatsapp for nokia cnet download - Dec 26 2021

web this whatsapp backgrounds for nokia asha 201 can be taken as capably as picked to act sharepoint 2010 john hales 2011 05 31 sharepoint 2010 is among the many

[whatsapp backgrounds for nokia asha 201 pdf uniport edu](#) - May 11 2023

web download and use 70 000 whatsapp wallpaper stock photos for free thousands of new images every day completely free to use high quality videos and images from pexels

200 whatsapp wallpapers wallpapers com - Mar 09 2023

web pronouncement whatsapp backgrounds for nokia 201 that you are looking for it will completely squander the time however below gone you visit this web page it will be

free whatsapp background photos pexels - Aug 14 2023

web download and use 100 000 whatsapp background stock photos for free thousands of new images every day completely free to use high quality videos and images from

whatsapp backgrounds for nokia asha 201 - Sep 22 2021

watsapp backgrounds for nokia 201 pdf - Apr 29 2022

web mar 16 2023 it is your categorically own time to be in reviewing habit in the midst of guides you could enjoy now is whatsapp backgrounds for nokia 201 pdf below

whatsapp for nokia asha download and install - Jul 13 2023

web whatsapp wallpapers for nokia asha 201 install whatsapp on nokia asha 501 502 503 500 dual sim asha 302 wallpapers for whatsapp nokia asha 302 yeah

whatsapp background for nokia asha 201 pdf - Jul 01 2022

web whatsapp backgrounds for nokia 201 pdf is available in our digital library an online access to it is set as public so you can get it instantly our book servers saves in multiple

watsapp backgrounds for nokia 201 - Dec 06 2022

web webjune 19th 2018 download and read whatsapp backgrounds for nokia asha 201 whatsapp backgrounds for nokia asha 201 change your habit to hang or waste the

watsapp backgrounds for nokia 201 pdf copy - Sep 03 2022

web whatsappbackgroundsfornokiaasha201 1 whatsappbackgroundsfornokiaasha201 whatsappbackgroundsfornokiaasha201 downloaded from class neetprep com by guest

whatsappfornokia201 pdf academy robotistan - Nov 24 2021

100 nokia wallpapers wallpapers com - Feb 08 2023

web tanjah de whatsapp backgrounds for nokia asha 201 imkaos de whatsapp backgrounds for nokia 201 skyylifestyles com whatsapp backgrounds for nokia

whatsapp wallpaper photos download the best free - Apr 10 2023

web get inspired and uplifted with nokia wallpapers download beautiful and lively designs that capture the essence of nokia s style and personality nokia wallpapers wallpapers

deforestation metaphor thepaper company - Jun 13 2023

web oct 16 2018 deforestation metaphor we have found this picture that we believe represents the problem of deforestation in our world the lungs of mother earth are represented by the trees and deforestation is slowing corrupting it the shows the lung having a disease and dying

metaphor or similes for deforestation - Feb 26 2022

web merely said the metaphor or similes for deforestation is universally compatible behind any devices to read the word party richard edwards 1986 loving words clutch crimson roses rude words sniff and pick their noses sly words come dressed up as foxes short words stand on cardboard boxes common words tell jokes and gabble complicated

metaphor or similes for deforestation - Aug 15 2023

web proliferating technologies command our attention many people complain of burnout and economic instability and the threat of ecological catastrophe fill us with dread we look to the past imagining life to have once been simpler and slower but extreme mental and physical stress is not a modern syndrome

metaphor or similes for deforestation book - Aug 03 2022

web times for their favorite novels like this metaphor or similes for deforestation but end up in malicious downloads rather than enjoying a good book with a cup of tea in the afternoon instead they cope with some malicious virus inside their computer metaphor or similes for deforestation is available in our book

deforestation synonyms 294 words and phrases for deforestation - Feb 09 2023

web another way to say deforestation synonyms for deforestation other words and phrases for deforestation synonyms for deforestation 294 other terms for deforestation words and phrases with similar meaning lists synonyms antonyms definitions sentences thesaurus words phrases parts of speech nouns verbs tags

deforestation metaphors illustrations vectors dreamstime - Dec 07 2022

web download 16 deforestation metaphors stock illustrations vectors clipart for free or amazingly low rates new users enjoy 60 off 218 681 876 stock photos online

metaphor or similes for deforestation seminary fbny org - Apr 11 2023

web 2 metaphor or similes for deforestation 2019 08 28 becoming set against a turbulent and poignant backdrop of deforestation the illegal pet trade and forest fires the puma years explores what happens when two desperate creatures in need of rescue find one another spectrum language arts grade 8 cambridge university press

what is a metaphor for deforestation answers - May 12 2023

web dec 24 2022 the animals dont have homes after deforestation are you seriously asking that if you know what deforestation is is the teacher was a raging lion a metaphor or a simile a metaphor a

metaphor or similes for deforestation 2022 monograf - Jun 01 2022

web 2 metaphor or similes for deforestation 2020 06 12 understanding metaphor raises key questions about the relationship between language and meaning and between language and mind this book explores how this understanding can impact upon the theory and practice of language teaching after summarising the cognitive basis of metaphor and

metaphor or similes for deforestation book beta dagensnaringsliv - Jul 14 2023

web set within the pages of metaphor or similes for deforestation a interesting fictional treasure sporting with raw feelings lies a fantastic quest waiting to be undertaken composed by a skilled wordsmith this

[metaphororsimilesfordeforestation pdf academy robotistan](#) - Jul 02 2022

web deforestation metaphor or similes for deforestation 8th grade vocabulary vocabulary list vocabulary com expat dating in germany chatting and dating front page de dictionary com s list of every word of the year unlocking owen sheersâ

[metaphor or similes for deforestation pdf uniport edu](#) - Oct 05 2022

web apr 16 2023 metaphor or similes for deforestation 1 9 downloaded from uniport edu ng on april 16 2023 by guest

metaphor or similes for deforestation this is likewise one of the factors by obtaining the soft documents of this metaphor or similes for deforestation by online you might not require more grow old to spend to go to the ebook foundation as

metaphor or similes for deforestation online kptm edu my - Mar 30 2022

web metaphor or similes for deforestation author online kptm edu my 2023 09 11 00 47 09 subject metaphor or similes for deforestation keywords metaphor or similes for deforestation created date 9 11 2023 12 47 09 am

[read free metaphor or similes for deforestation pdf for free](#) - Nov 06 2022

web read free metaphor or similes for deforestation pdf for free concise dictionary of metaphors and similies pocket size similes dictionary similes and metaphors a dictionary of simile and metaphor in greek poetry from homer to aeschylus jun 05 2020 this work has been selected by scholars as being culturally

[metaphor or similes for deforestation pdf download only](#) - Mar 10 2023

web of deforestation and reforestation and future challenges facing our forests fully updated throughout and with new contributions from international experts this second edition includes new chapters on climate change and international forest policy and expanded coverage of forest products and bioenergy production

deforestation synonyms 4 synonyms antonyms for - Jan 08 2023

web logging denuding compare synonyms on this page you ll find 4 synonyms antonyms and words related to deforestation such as desertification erosion logging and null if governments do not take action to control greenhouse gases and deforestation a vicious cycle will ensue where fires may lead to more fires

metaphor or similes for deforestation dat slashmobility com - Apr 30 2022

web aug 2 2023 metaphor or similes for deforestation author dat slashmobility com 2023 08 02 23 53 10 subject metaphor or similes for deforestation keywords metaphor or similes for deforestation created date 8 2 2023 11 53 10 pm

metaphor or similes for deforestation pdf free voto uneal edu - Sep 04 2022

web metaphor or similes for deforestation pdf a mesmerizing literary creation penned by way of a celebrated wordsmith readers embark on an enlightening odyssey unraveling the intricate significance of language and its enduring effect on our

lives

metaphor or similes for deforestation pqr uiaf gov co - Jan 28 2022

web middle of them is this metaphor or similes for deforestation that can be your partner nature and the environment in early buddhism shravasti dhammika 2018 oppian s halieutica emily kneebone 2020 09 30 oppian s halieutica is a dazzling five book greek

metaphor or similes for deforestation beta iptires com - Dec 27 2021

web jan 7 2023 4717847 metaphor or similes for deforestation 3 25 downloaded from beta iptires com on by guest each new concept clearly explained and highlighted authentic texts from a wide range of sources both spoken and written to illustrate grammatical usage clear chapter and module summaries enabling efficient class preparation and student