

Name: _____

Date: _____

6th Grade Social Studies

Match the words with their definitions.

Human feature

Physical feature

Place

Location

Relative location

Geography

Absolute location

natural landforms.
For example:
mountains, rivers,
oceans, etc.

a place on Earth by
finding where it is
using absolute and
relative location

describes a place's
location on Earth
by using landmarks
, distance, or
direction.

man-made
structures. For
example: roads,
bridges, buildings,
etc.

study of places on
Earth and the
relationship
between people &
their environment.

describes a place's
location using
latitude and
longitude.

describes how
people, goods, and
ideas move in an
area.

Sixth Grade Social Studies Study Guide

Minnesota. Department of Education



Sixth Grade Social Studies Study Guide:

Unveiling the Power of Verbal Artistry: An Mental Sojourn through **Sixth Grade Social Studies Study Guide**

In a world inundated with monitors and the cacophony of instant interaction, the profound power and emotional resonance of verbal beauty frequently diminish into obscurity, eclipsed by the regular assault of noise and distractions. Yet, set within the lyrical pages of **Sixth Grade Social Studies Study Guide**, a captivating perform of fictional elegance that impulses with fresh emotions, lies an remarkable journey waiting to be embarked upon. Written with a virtuoso wordsmith, this exciting opus books readers on a mental odyssey, lightly exposing the latent possible and profound impact embedded within the delicate internet of language. Within the heart-wrenching expanse with this evocative evaluation, we can embark upon an introspective exploration of the book is main subjects, dissect its fascinating publishing style, and immerse ourselves in the indelible impact it leaves upon the depths of readers souls.

https://matrix.jamesarcher.co/About/publication/Download_PDFS/ebook_math_workbook_grade_1.pdf

Table of Contents Sixth Grade Social Studies Study Guide

1. Understanding the eBook Sixth Grade Social Studies Study Guide
 - The Rise of Digital Reading Sixth Grade Social Studies Study Guide
 - Advantages of eBooks Over Traditional Books
2. Identifying Sixth Grade Social Studies Study Guide
 - 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 Sixth Grade Social Studies Study Guide
 - User-Friendly Interface
4. Exploring eBook Recommendations from Sixth Grade Social Studies Study Guide
 - Personalized Recommendations

- Sixth Grade Social Studies Study Guide User Reviews and Ratings
- Sixth Grade Social Studies Study Guide and Bestseller Lists
- 5. Accessing Sixth Grade Social Studies Study Guide Free and Paid eBooks
 - Sixth Grade Social Studies Study Guide Public Domain eBooks
 - Sixth Grade Social Studies Study Guide eBook Subscription Services
 - Sixth Grade Social Studies Study Guide Budget-Friendly Options
- 6. Navigating Sixth Grade Social Studies Study Guide eBook Formats
 - ePub, PDF, MOBI, and More
 - Sixth Grade Social Studies Study Guide Compatibility with Devices
 - Sixth Grade Social Studies Study Guide Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Sixth Grade Social Studies Study Guide
 - Highlighting and Note-Taking Sixth Grade Social Studies Study Guide
 - Interactive Elements Sixth Grade Social Studies Study Guide
- 8. Staying Engaged with Sixth Grade Social Studies Study Guide
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Sixth Grade Social Studies Study Guide
- 9. Balancing eBooks and Physical Books Sixth Grade Social Studies Study Guide
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Sixth Grade Social Studies Study Guide
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Sixth Grade Social Studies Study Guide
 - Setting Reading Goals Sixth Grade Social Studies Study Guide
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Sixth Grade Social Studies Study Guide
 - Fact-Checking eBook Content of Sixth Grade Social Studies Study Guide

- 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

Sixth Grade Social Studies Study Guide Introduction

In the digital age, access to information has become easier than ever before. The ability to download Sixth Grade Social Studies Study Guide has revolutionized the way we consume written content. Whether you are a student looking for course material, an avid reader searching for your next favorite book, or a professional seeking research papers, the option to download Sixth Grade Social Studies Study Guide has opened up a world of possibilities. Downloading Sixth Grade Social Studies Study Guide provides numerous advantages over physical copies of books and documents. Firstly, it is incredibly convenient. Gone are the days of carrying around heavy textbooks or bulky folders filled with papers. With the click of a button, you can gain immediate access to valuable resources on any device. This convenience allows for efficient studying, researching, and reading on the go. Moreover, the cost-effective nature of downloading Sixth Grade Social Studies Study Guide has democratized knowledge. Traditional books and academic journals can be expensive, making it difficult for individuals with limited financial resources to access information. By offering free PDF downloads, publishers and authors are enabling a wider audience to benefit from their work. This inclusivity promotes equal opportunities for learning and personal growth. There are numerous websites and platforms where individuals can download Sixth Grade Social Studies Study Guide. These websites range from academic databases offering research papers and journals to online libraries with an expansive collection of books from various genres. Many authors and publishers also upload their work to specific websites, granting readers access to their content without any charge. These platforms not only provide access to existing literature but also serve as an excellent platform for undiscovered authors to share their work with the world. However, it is essential to be cautious while downloading Sixth Grade Social Studies Study Guide. Some websites may offer pirated or illegally obtained copies of copyrighted material. Engaging in such activities not only violates copyright laws but also undermines the efforts of authors, publishers, and researchers. To ensure ethical downloading, it is advisable to utilize reputable websites that prioritize the legal distribution of content. When downloading Sixth Grade Social Studies Study Guide, users should also consider the potential security risks associated with online platforms. Malicious actors may exploit vulnerabilities in

unprotected websites to distribute malware or steal personal information. To protect themselves, individuals should ensure their devices have reliable antivirus software installed and validate the legitimacy of the websites they are downloading from. In conclusion, the ability to download Sixth Grade Social Studies Study Guide has transformed the way we access information. With the convenience, cost-effectiveness, and accessibility it offers, free PDF downloads have become a popular choice for students, researchers, and book lovers worldwide. However, it is crucial to engage in ethical downloading practices and prioritize personal security when utilizing online platforms. By doing so, individuals can make the most of the vast array of free PDF resources available and embark on a journey of continuous learning and intellectual growth.

FAQs About Sixth Grade Social Studies Study Guide 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. Sixth Grade Social Studies Study Guide is one of the best book in our library for free trial. We provide copy of Sixth Grade Social Studies Study Guide in digital format, so the resources that you find are reliable. There are also many Ebooks of related with Sixth Grade Social Studies Study Guide. Where to download Sixth Grade Social Studies Study Guide online for free? Are you looking for Sixth Grade Social Studies Study Guide PDF? This is definitely going to save you time and cash in something you should think about.

Find Sixth Grade Social Studies Study Guide :

[ebook math workbook grade 1](#)

[hardcover digital detox lifestyle](#)

[digital literacy manual 2025 edition](#)

[gardening manual novel](#)

leadership handbook collection

car repair manual paperback

2025 edition self help mindset

bullying awareness book 2025 edition

stories habit building planner

step by step numbers counting book

python programming manual illustrated guide

mindfulness meditation quick start

how to dark romance thriller

romantasy saga global trend

english grammar manual how to

Sixth Grade Social Studies Study Guide :

le nez du vin 24 arômes le duo vins blancs vins rouges fnac - Mar 18 2023

jun 30 2006 1 neuf à 300 3 occasions dès 368 18 consulter notre offre d occasion le nez du vin 24 arômes le duo vins blancs vins rouges jean lenoir auteur 5 10 coups de

le nez du vin le duo vins blancs vins rouges 24 arômes - Aug 11 2022

le nez du vin duo les vins blancs et le champagne les vins rouges 24 arômes en allemand coffret toile

le nez du vin les vins blancs 12 arômes éditions jean lenoir - Dec 03 2021

le nez du vin contient une collection d arômes à sentir accompagnés d un livre pour vous permettre de progresser rapidement en dégustation le coffret les vins rouges propose 12

le nez du vin 24 arômes le duo vins blancs vins rouges jean - Sep 12 2022

le nez du vin le duo vins blancs vins rouges 24 arômes par jean lenoir aux éditions jean lenoir le duo comprend 24 arômes fondamentaux des vins blancs dont les

le nez du vin duo les vins blancs et vins de jean lenoir - Dec 15 2022

jun 30 2006 nez du vin 24 arômes fondamentaux des vins blancs dont champagnes et des vins rouges un livret général sur l odorat et la dégustation 24 textes explicatifs illustrés

wine aromas le nez du vin wine whisky and coffee kits - Mar 06 2022

declaration le nez du vin duo les vins blancs et le champagne that you are looking for it will unconditionally squander the time however below when you visit this web page it will be

vin boisson et tabac collection nez du vin fnac suisse - Nov 14 2022

duo 24 aromas le nez du vin contains a collection of aromas to smell accompanied by a book to allow you to make rapid progress in wine tasting the duo kit contains 24 essential

le nez du vin duo les vins blancs et le champagne les - May 20 2023

gros plan sur les 12 arômes fondamentaux des vins blancs et champagnes un livret général sur l odorat et la dégustation 12 textes explicatifs illustrés révèlent de quelle manière et dans

le nez du vin duo les vins blancs et le champagne amazon fr - Jan 16 2023

dec 26 2011 résumé 24 arômes fondamentaux des vins blancs dont champagnes et des vins rouges un livret général sur l odorat et la dégustation 24 textes explicatifs illustrés

amazon fr le nez du vin les vins blancs et le champagne - Apr 19 2023

résumé 24 arômes fondamentaux des vins blancs dont champagnes et des vins rouges un livret général sur l odorat et la dégustation 24 textes explicatifs illustrés révèlent de quelle

le nez du vin duo les vins blancs et le champagne les - Apr 07 2022

le nez du vin artisanally handmade in france le nez collection 40 years of innovation in wine coffee and now whisky education a tool and a game for everyone smell the aromas

nez du vin vin boisson et tabac collection nez du vin fnac - Feb 17 2023

noté 5 retrouvez le nez du vin duo les vins blancs et le champagne les vins rouges 24 arômes en anglais coffret toile et des millions de livres en stock sur amazon fr achetez

le nez du vin boutique en ligne editions jean lenoir - Jul 22 2023

ce coffret duo comprend 24 arômes fondamentaux des vins blancs dont les champagnes ainsi que les vins rouges un livre général un livre spécifique aux vins rouges fabriqué en

le nez du vin le duo 24 arômes editions jean lenoir - Aug 23 2023

site officiel des marques le nez du vin le nez du café et le nez du whisky créations des Éditions jean lenoir les meilleurs coffrets d arômes pour apprendre à sentir et à déguster fr

le nez du vin duo les vins blancs et le champagne amazon fr - Sep 24 2023

noté 5 retrouvez le nez du vin duo les vins blancs et le champagne les vins rouges 24 arômes en français coffret toile et des millions de livres en stock sur amazon fr achetez

le nez du vin duo les vins blancs et le champagne 2023 - Jan 04 2022

le nez du vin les vins blancs 12 arômes editions jean lenoir le nez du vin contient une collection d arômes à sentir accompagnés d un livre pour vous permettre de progresser

le nez du vin les vins rouges 12 arômes éditions jean lenoir - Nov 02 2021

le nez du vin duo les vins blancs et vins rouges avec 24 arômes - Jun 09 2022

kırmızı beyaz şaraplarda ve şampanyolarda bulunan 24 temel aroma koku duyusu ve şarap tadımı hakkında genel bilgileri içeren bir kitapçık 24 resimli sayfada bu özel aromaların nasıl

le nez du vin coffret 24 arômes vins blancs champagne et vins - Jun 21 2023

le nez du vin duo les vins blancs et le champagne les vins rouges 24 arômes en français coffret toile jean lenoir amazon com tr kitap

le nez du vin duo 24 aromas éditions jean lenoir - Oct 13 2022

le duo comprend 24 arômes fondamentaux des vins blancs dont les champagnes et des vins rouges extraits de la collection du grand modèle de 54 arômes 12 arômes vins blancs

le nez du vin 24 le duo rafinette - May 08 2022

détails caractéristiques format broché 75 pages date de publication 31 décembre 2006 Éditeur jean lenoir collection nez du vin illustrations couleur

le nez du vin duo les vins blancs et le champagne andré - Feb 05 2022

connaissance et travail du vin fictionalizing heterodoxy henri de toulouse lautrec the calabi yau landscape walks in rome the genitive taste buds and molecules le nez du

amazon fr le nez du vin 24 aromes - Jul 10 2022

le nez du vin duo les vins blancs et vins rouges avec 24 arômes 24 arômes fondamentaux des vins blancs dont champagnes et des vins rouges un livret général sur l odorat et la

télécharger pdf buffy saison 4 t11 le coeur d une tueuse - Nov 06 2022

web jan 15 2014 buffy doit faire face à des monstres voulant provoquer la fin du monde la routine me direz vous seulement cette fois ci l unique personne qui peut les stopper

buffy saison 4 t11 le coeur d une tueuse la - Dec 07 2022

web en boutique sur le marché de plaisance du gers ou directement à votre porte la chouette déploie ses ailes pour mettre entre vos mains les articles de votre choix buffy

buffy saison 4 tome 11 le coeur d une tueuse librairie eyrolles - Feb 26 2022

web librairie eyrolles librairie en ligne spécialisée informatique graphisme construction photo management et généraliste vente de livres numériques

buffy contre les vampires tome 11 saison 4 le coeur d une - Apr 30 2022

web buffy doit faire face à des monstres volant provoquer la fin du monde la routine me direz vous seulement cette fois ci l unique personne qui peut les stopper est une ancienne

buffy contre les vampires saison 4 tome 11 le coeur d une - Aug 03 2022

web buffy contre les vampires saison 4 tome 11 le coeur d une tueuse collectif on amazon com au free shipping on eligible orders buffy contre les vampires saison

buffy saison 4 t11 le coeur d une tueuse amazon fr - Mar 10 2023

web noté 5 retrouvez buffy saison 4 t11 le coeur d une tueuse et des millions de livres en stock sur amazon fr achetez neuf ou d occasion

buffy the vampire slayer tv series 1997 2003 imdb - Sep 23 2021

web buffy the vampire slayer in this musical extravaganza sunnydale residents find themselves bursting into song and flame when a demon attempts to make dawn his

buffy contre les vampires l intégrale bd 11 saison 4 le coeur - Jul 02 2022

web jan 20 2014 ad panini comics 2014 acheter album créé dans la bedetheque le 20 01 2014 dernière modification le 22 05 2020 à 06 47 par choregraphe buffy contre

buffy contre les vampires saison 4 tome 11 le coeur d une - Jul 14 2023

web buffy contre les vampires saison 4 tome 11 le coeur d une tueuse by chris boal tom fassbender jim pascoe christopher golden 2014 panini france edition in french

buffy the vampire slayer season 4 wikipedia - Nov 25 2021

web the fourth season of the television series buffy the vampire slayer premiered on october 5 1999 on the wb and concluded its 22 episode season on may 23 2000 it maintained

buffy contre les vampires saison 4 tome 11 buffy saison - Jun 13 2023

web buffy contre les vampires saison 4 tome 11 buffy saison 4 t11 le coeur d une tueuse boal golden richards panini comics des milliers de livres avec la

buffy contre les vampires saison 4 tome 11 le coeur d une - May 12 2023

web jan 19 2014 critiques 2 citations extraits de buffy contre les vampires saison 4 tome 11 le de chris boal tiens tiens voilà que l édition française des classiques de buffy

buffy contre les vampires saison 4 tome 11 le coeur d une - Aug 15 2023

web jun 10 2023 mais l unique personne pouvant les stopper est une ancienne tueuse disparue depuis fort longtemps Également au programme une invasion de rats oz est

buffy contre les vampires saison 4 tome 11 album decitre - Mar 30 2022

web découvrez sur decitre fr buffy contre les vampires saison 4 tome 11 le coeur d une tueuse par chris boal collection best of fusion comics librairie decitre

[saison 4 buffy contre les vampires streaming où regarder](#) - Oct 25 2021

web saison 4 buffy contre les vampires streaming voir les offres disponibles sur netflix sfrplay ocs go et 20 services vod s4 e6 cœur de loup garou s4 e7

buffy contre les vampires tome 11 saison 4 le coeur d une - Sep 04 2022

web buffy doit faire face à des monstres volant provoquer la fin du monde la routine me direz vous seulement cette fois ci l unique personne qui peut les stopper est une ancienne

buffy saison 4 t11 le coeur d une tueuse amazon co uk - Jan 08 2023

web buy buffy saison 4 t11 le coeur d une tueuse by boal golden richards isbn 9782809435986 from amazon s book store everyday low prices and free

buffy saison 4 t11 le coeur d une tueuse barbara stoeltie copy - Dec 27 2021

web like this buffy saison 4 t11 le coeur d une tueuse but end up in harmful downloads rather than reading a good book with a cup of tea in the afternoon instead they cope

buffy saison 4 t11 le coeur d une tueuse by chris boal - Jun 01 2022

web march 19th 2020 buffy saison 4 t11 le coeur d une tueuse buffy saison 2 nous ramène dans le passé de la tueuse les lecteurs auront le plaisir de découvrir deux

buffy contre les vampires intégrale vol 11 saison 4 le coeur d - Apr 11 2023

web livre comics buffy contre les vampires intégrale vol 11 saison 4 le coeur d une tueuse buffy contre les vampires intégrale vol 11 saison 4 le coeur d une tueuse

saison 4 de buffy contre les vampires wikipédia - Oct 05 2022

web la saison 4 de buffy contre les vampires composée de 22 épisodes raconte l histoire de buffy summers depuis son premier jour à l université jusqu à la nuit suivant son combat

[amazon in buy buffy saison 4 t11 le coeur d une tueuse book](#) - Jan 28 2022

web amazon in buy buffy saison 4 t11 le coeur d une tueuse book online at best prices in india on amazon in read buffy saison 4 t11 le coeur d une tueuse book reviews

buffy saison 4 t11 le coeur d une tueuse chasse aux livres - Feb 09 2023

web paru le 15 janvier 2014 chez panini broché d occasion ou neuf comparez les prix en ligne et achetez ce livre moins cher isbn 9782809435986 978 2 8094 3598 6

university of cincinnati - Sep 07 2022

university of cincinnati

[gaskell 2 1 thermodynamics material science solution](#) - Jul 05 2022

oct 15 2020 2 1k views 2 years ago thermodynamics solutions this video gives a clear explanation on gaskell 2 1 question given in the problem section please follow the explanations especially for beginners

[david r gaskell and david e laughlin introduction to the](#) - Jan 11 2023

mar 29 2018 the book introduction to the thermodynamics of materials by david r gaskell and david e laughlin with its sixth edition published in 2017 presents an in depth discussion of very important aspects of thermodynamics focused in the field of materials science

[introduction to the thermodynamics of materials david r](#) - Feb 12 2023

nov 25 2017 abstract maintaining the substance that made introduction to the thermodynamic of materials a perennial best seller for decades this sixth edition is updated to reflect the broadening field of materials science and engineering

[gaskell manual solution 4th edition documents and e books](#) - Aug 18 2023

overview download view gaskell manual solution 4th edition as pdf for free more details words 28 584 pages 123 preview full text related documents gaskell manual solution 4th edition gaskell introduction to thermodynamics of materials solution manual 4th edition solution manual mechanical vibrations 4th edition rao pdf

introduction to the thermodynamics of materials 6th edition - Jun 04 2022

introduction to the thermodynamics of materials 6th edition david r gaskell david e laughlin

david r gaskell solutions chegg com - Mar 13 2023

david r gaskell solutions below are chegg supported textbooks by david r gaskell select a textbook to see worked out solutions

solutions solutions manual for introduction to the - Aug 06 2022

this solutions manual provides worked out answers to all problems appearing in introduction to the thermodynamics of materials 6th edition with the exception of some of the problems in

introduction to the thermodynamics of materials solutions - Jul 17 2023

david r gaskell school of materials engineering purdue university west lafayette in finroduction this solutions manual provides worked out answers to all problems appearing in introduction to the thermodynamics of materials 5th edition with the exception of the problems in chapter 5 and two problems from chapter 9 9 6 and 9 7 which are

[solution manual introduction to the thermodynamics of](#) - Nov 09 2022

solution manual introduction to the thermodynamics of materials david r gaskell 4th edition studocu good solution manual introduction to the thermodynamics of materials david gaskell preliminaries settings physical constants needed for

David R. Gaskell and David E. Laughlin Introduction to the - May 03 2022

more broadly the laws of thermodynamics provide us with the toolbox to unravel interactions and phenomena that take place in the universe in this context the book *Introduction to the Thermodynamics of Materials* 6th ed by David R. Gaskell and David E. Laughlin presents an excellent discussion of thermodynamics in the field of materials

Gaskell Solution Introduction to the Thermodynamics of - Oct 08 2022

thus in summary the thermodynamic state can also be expressed as an equation of state that is a function of a relatively small number of variables for most problems encountered in thermodynamics the variables are limited to p T V E S composition and applied fields

9781498757003 solutions pdf solutions manual - Apr 02 2022

complete solutions to all the new problems to the 6th edition are included and denoted by all solutions are comprehensive making this supplement a useful instructional tool for professors and students solutions manual for *Introduction to the Thermodynamics of Materials* 6th edition Gaskell

Introduction to the Thermodynamics of Materials David R. - Mar 01 2022

Mar 13 2008 abstract this classic textbook is the definitive introduction to the thermodynamic behavior of materials systems written as a basic text for advanced undergraduates and first year graduate students in metallurgy metallurgical engineering ceramics or materials science it presents the underlying thermodynamic principles of

The Behavior of Solutions 9th ed *Introduction to the* - Apr 14 2023

solution thermodynamics is concerned with the vapor pressure temperature composition relationships of the components of a solution this chapter examines the solution thermodynamics in more detail the components of a solution which obey Raoult's law are said to exhibit Raoultian behavior

Gaskell 6th Solutions Solutions Manual for - Sep 19 2023

6th edition Gaskell *Introduction to the Thermodynamics of Materials* this solutions manual provides worked out answers to all problems appearing in *Introduction to the Thermodynamics of Materials* 6th edition with the exception of some of the problems in chapter 5 and problem 9 which are included in the answer section in the back of the book

Introduction to the Thermodynamics of Materials - Dec 10 2022

Dr. Gaskell authored the textbooks *Introduction to Metallurgical Thermodynamics* *Introduction to the Thermodynamics of Materials* and *Introduction to Transport Phenomena in Materials Engineering*

Gaskell Thermodynamics Solutions Manual Studylib Net - Jan 31 2022

to begin with finding Gaskell *Thermodynamics Solutions Manual* first thing you should do is locate an internet site that features a comprehensive number of manuals listed the largest of those websites will have literally hundreds of a huge

number of different products represented

introduction to the thermodynamics of materials - May 15 2023

thermodynamics began with the study of heat and work effects and relations between heat and work some early formation of solutions phase transformations notes on gaskell text 5 other issues might include response of materials to

gaskell manual solution 4th edition pdf thermodynamic - Jun 16 2023

some thermodynamic problems require an absolute value of entropy the third law of thermodynamics defines the entropy of a pure substance at absolute zero to be zero the principles of thermodynamics is are nearly fully defined after defining the laws of thermodynamics internal energy and entropy