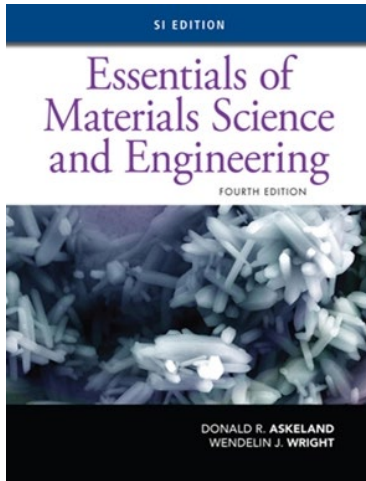


## MindTap Quick Start Guide



**Essentials of Materials Science and Engineering, SI Edition, 4<sup>th</sup> Edition**  
 Donald R. Askeland, Wendelin J. Wright

Help your students understand the science of materials in order to select and deploy materials as responsible engineers with Askeland/Wright's ESSENTIALS OF MATERIALS SCIENCE AND ENGINEERING, 4TH Edition. Your students develop a foundational understanding of why materials behave the way they do, and how they are best used in actual engineering practice. Students learn why materials display certain properties as they study how the structure and processing of materials results in these properties. The authors link fundamental concepts to practical applications, emphasizing the necessary basics without overwhelming readers with too much underlying chemistry or physics.

### 3 Key Features

Activity	Where to find it – an example	What is it	Why it matters
Algorithmic Problem Sets	<ol style="list-style-type: none"> <li>Chapter 2: Atomic Structure</li> <li>Chapter 2 Problem Set</li> <li>Click on Start Assignment Now</li> </ol>	<b>Algorithmic Problem Sets</b> Algorithmically-generated problem sets can regenerate, with new numbers each time. Student solutions are automatically graded, and detailed solutions are provided for incorrect answers.	Because the numeric values can regenerate over and over again, these problem sets maximize students' opportunities to practice. You, as the instructor, can be confident knowing each student is receiving unique problems to solve.
Videos	<ol style="list-style-type: none"> <li>Chapter 2: Atomic Structure</li> <li>Chapter 2 Videos</li> <li>Alkali Metals in Water</li> </ol> <p><i>See it in the Cengage Mobile app</i></p>	<b>Videos</b> Videos illustrating engineering concepts and real-world applications can be found in the learning path of relevant chapters.	Videos serve to reinforce what is introduced in the readings. With the addition of the video content, the student is not just reading – he or she is also watching, listening, and thinking about how abstract engineering concepts inform real-world practice.
Knovel Problems	<ol style="list-style-type: none"> <li>)</li> <li>s</li> <li>?</li> </ol>	<b>Knovel Problems</b> Problems that require the use of Knovel: an online aggregator of engineering references.	Allow students more experience using various engineering references and sources.

**Askeland/Wright, *The Science and Engineering of Materials, SI Edition,*  
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**MindTap Asset Description**

Activity	How many?	What is it?	Seat time?	Why it matters?
<b>eBook Chapter</b>	23	The MindTap Reader contains all content from the printed text. MindTap Reader also allows students to make notes and highlights in-text, (which are automatically captured and hyperlinked in the StudyHub app), view notes and content added by the instructor, and even have the content read aloud to them.	45-60 Minutes	Readings provide the foundation of knowledge needed to successfully complete quizzes, problem sets, and in-class work, setting your students up for success.
<b>Have You Ever Wondered?</b>	23	Preliminary questions at the start of each chapter.	1-5 Minutes	These questions raise real-world issues, allowing students to understand the importance of many topics.
<b>Chapter Learning Objectives</b>	23	Bulleted lists of key learning objectives within a chapter.	1-5 Minutes	Offer students a preview of the key topics within a chapter.
<b>Design Problems</b>	83	Problems centered around material design.	Varies by student	These problems challenge students to apply what they've learned to real world design applications.
<b>Computer Problems</b>	27	Problems requiring students to write computer programs.	Varies by student	Allow students opportunities to demonstrate what they've learned by creating computer programs based around these topics.
<b>Knovel Problems</b>	45	Problems that require the use of Knovel: an online aggregator of engineering references.	Varies by student	Allow students more experience using various engineering references and sources.

<b>Algorithmic Problem Sets</b>	22	Algorithmically-generated problem sets can regenerate, with new numbers each time. Student solutions are automatically graded, and detailed solutions are provided for incorrect answers.	Varies by student	Because the numeric values can regenerate over and over again, these problem sets maximize students' opportunities to practice. You, as the instructor, can be confident knowing each student is receiving unique problems to solve.
<b>Quiz (CNOW)</b>	23	Automatically graded quizzes assess understanding of the chapter. They include feedback for correct and incorrect answers, and explain where to find more information in the text by linking a specific section.	Varies by student	Measure how well the student mastered the material after completing each MindTap chapter. Helps the student study more efficiently by identifying gaps in their knowledge and pointing to the relevant portion of the text.
<b>Drop-box assignment (practice)(CNOW)</b>	23	Students can upload and submit practice assignments via a drop box integrated within MindTap.	Varies by student	Provide opportunities for practice. This feature enables students to submit papers, reflections, and other kinds of written materials as suggested or required by the instructor.
<b>Reflective Questions</b>	7 per chapter (10 chapters)	Short structured activities every few chapters. Questions ask students what they did to prepare for quizzes or problem sets, where they made errors, and what they can do differently next time.	Varies by student	Research has found these type of "wrapper" questions improve student learning. They help students focus on how they study and the relative effectiveness of those study habits.
<b>Videos</b>	46	Videos illustrating engineering concepts and real-world applications can be found in the learning path of relevant chapters.	0:25-18:30	Videos serve to reinforce what is introduced in the readings. With the addition of the video content, the student is not just reading – he or she is also watching, listening, and thinking about how abstract engineering concepts inform real-world practice.

<b>Web Links</b>	4	Internet links illustrating engineering concepts and real-world applications can be found in the learning path of relevant chapters.	Varies by student	The links serve to not only reinforce what is introduced in the readings, but also to energize and excite students by showing contemporary engineering applications.
<b>Flashcards</b>	824	Flashcards that help students learn definitions of core concepts and key terms. Students can also create and add their own cards to the stack.	Varies by student	Self-testing via flashcards (not for grades) is validated by robust research. The act of calling information to mind strengthens that knowledge and aids in future retrieval making flashcards an important learning tool.

<b>Chapter</b>	<b>MindTap Assignments</b>
<b>Chapter 1: Introduction to Materials Science and Engineering</b>	Videos Quiz Drop Box
<b>Chapter 2: Atomic Structure</b>	Videos Quiz Problem Set Reflective Questions Drop Box
<b>Chapter 3: Atomic and Ionic Arrangements</b>	Quiz Problem Set Drop Box
<b>Chapter 4: Imperfections in the Atomic and Ionic Arrangements</b>	Videos Quiz Problem Set Drop Box
<b>Chapter 5: Atom and Ion Movements in Materials</b>	Quiz Problem Set Reflective Questions Drop Box
<b>Chapter 6: Mechanical Properties: Part One</b>	Videos Quiz Problem Set Drop Box
<b>Chapter 7: Mechanical Properties: Part Two</b>	Videos Quiz Problem Set Reflective Questions Drop Box
<b>Chapter 8: Strain Hardening and Annealing</b>	Videos Quiz Problem Set Drop Box
<b>Chapter 9: Principles of Solidification</b>	Videos Quiz Problem Set Drop Box

<b>Chapter 10: Solid Solutions and Phase Equilibrium</b>	<b>Quiz</b> <b>Problem Set</b> <b>Reflective Questions</b> <b>Drop Box</b>
<b>Chapter 11: Dispersion Strengthening and Eutectic Phase Diagrams</b>	<b>Quiz</b> <b>Problem Set</b> <b>Drop Box</b>
<b>Chapter 12: Dispersion Strengthening by Phase Transformations and Heat Treatment</b>	<b>Videos</b> <b>Quiz</b> <b>Problem Set</b> <b>Drop Box</b>
<b>Chapter 13: Heat Treatment of Steels and Cast Irons</b>	<b>Videos</b> <b>Quiz</b> <b>Problem Set</b> <b>Reflective Questions</b> <b>Drop Box</b>
<b>Chapter 14: Nonferrous Alloys</b>	<b>Videos</b> <b>Quiz</b> <b>Problem Set</b> <b>Drop Box</b>
<b>Chapter 15: Ceramics</b>	<b>Videos</b> <b>Quiz</b> <b>Problem Set</b> <b>Reflective Questions</b> <b>Drop Box</b>
<b>Chapter 16: Polymers</b>	<b>Videos</b> <b>Quiz</b> <b>Problem Set</b> <b>Drop Box</b>
<b>Chapter 17: Composites: Teamwork and Synergy in Materials</b>	<b>Videos</b> <b>Quiz</b> <b>Problem Set</b> <b>Reflective Questions</b> <b>Drop Box</b>
<b>Chapter 18: Construction Materials</b>	<b>Videos</b> <b>Quiz</b> <b>Problem Set</b> <b>Drop Box</b>

<b>Chapter 19: Electronic Materials</b>	<b>Quiz</b> <b>Problem Set</b> <b>Reflective Questions</b> <b>Drop Box</b>
<b>Chapter 20: Magnetic Materials</b>	<b>Quiz</b> <b>Problem Set</b> <b>Drop Box</b>
<b>Chapter 21: Photonic Materials</b>	<b>Quiz</b> <b>Problem Set</b> <b>Reflective Questions</b> <b>Drop Box</b>
<b>Chapter 22: Thermal Properties of Materials</b>	<b>Quiz</b> <b>Problem Set</b> <b>Drop Box</b>
<b>Chapter 23: Corrosion and Wear</b>	<b>Videos</b> <b>Quiz</b> <b>Problem Set</b> <b>Reflective Questions</b> <b>Drop Box</b>