

Lake Shore Public Schools
28850 Harper
St. Clair Shores, MI 48081

**A
PARENT'S GUIDE
TO
MATHEMATICS/ENGLISH LANGUAGE ARTS
GRADE LEVEL CONTENT EXPECTATIONS**

**WHAT YOUR CHILD NEEDS
TO KNOW BY THE END OF**

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Welcome to Our School

This school year promises to be an exciting time for your child, filled with learning, discovery, and growth. It is also a time to share a new guide the Michigan Department of Education has developed for you, outlining the types of literacy and mathematics skills students should know and be able to do at the end of each grade.

Please feel free to share this guide with your family and friends. Use it when you talk with your child's teacher. Ask what *you* can do to support learning in the classroom and reinforce learning at home. You can find more ideas and tools to help you stay involved in your child's education at www.michigan.gov/mde.

We value and share your commitment to your child's education. We look forward to working together to help your child achieve and succeed.

Elementary Principals

George Lewis, Masonic Heights Elementary
Martha Kliebert, James Rodgers Elementary
Elizabeth Netschke, Violet Elementary

A Parent Guide to Grade Level Content Expectations

Michigan Sets High Academic Standards –for ALL

This booklet is a part of Michigan’s Mathematics and English Language Arts Grade Level Content Expectations (GLCE). It is just one in a series of tools available for schools and families. The Michigan Department of Education (MDE) provides similar booklets for families of children in grades K-5.

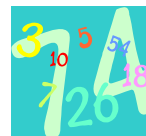
Teacher versions of the Grade Level Content Expectations are finished for grades kindergarten through fifth. They state in clear and measurable terms what students in each grade are expected to know and be able to do. They also guide the design of the state’s grade level MEAP tests required in the No Child Left Behind Act (NCLB) legislation.

Educators and classroom teachers from Michigan school districts have been involved in the development and/or review of Michigan’s GLCE. The expectations were designed to ensure that students receive seamless instruction, from one grade to the next, leaving no gaps in any child’s education. More importantly, they set high expectations in literacy and mathematics so we can better prepare all K-12 students for the challenges they will face in a global 21st century.

To learn more about the Michigan Curriculum Framework, visit www.michigan.gov/mde and click on “**K-12 Curriculum.**”

Fourth Grade Mathematics is the science of patterns and relationships. It is the language and logic of our technological world. Mathematical power is the ability to explore, to imagine, to reason logically and to use a variety of mathematical methods to solve problems – all important tools for children’s futures. A mathematically powerful person should be able to:

- reason mathematically.
- communicate mathematically.
- solve problems using mathematics.
- make connections within mathematics and between mathematics and other fields.



Michigan’s **Mathematics Grade Level Content Expectations** (GLCE) are organized into five strands:

- Number and Operations
- Algebra
- Geometry
- Measurement
- Data and Probability

By the end of fourth grade, students should have a good foundation in addition and subtraction of whole numbers and will have done much in multiplication and division of whole numbers. Work in number also extends to fractions and decimal fractions, using limited sets of fractions as the basis for building meaning for equivalent fractions, addition, subtraction, and fraction as part of a set of objects. Work in measurement becomes more complex with a focus on units and conversion within systems of units. In order to allow for the development of Number and Operations, there is a limited focus on Geometry, and Data and Probability.

Glossary Terms

Words that have asterisks (*) are defined in the Glossary located at the end of the math section.

NUMBER AND OPERATIONS

Understand and Use Number Notation and Place Value

Read and write numbers to 1,000,000; relate them to the quantities they represent.

Compare (greater than > and less than <)

Compose and decompose numbers using place value to 1,000,000’s.

Example:

425,068 is 4 one hundred thousands, 2 ten thousands,

5 thousands, 0 hundreds, 6 tens, and 8 ones

$400,000 + 20,000 + 5,000 + 0 + 60 + 8$.

Understand the magnitude of numbers up to 1,000,000; recognize the place values of numbers, and the relationship of each place value to the place to its right.

- Example: 800,000 is 800 thousands or 8000 hundreds.

Use Factors and Multiples

Find all factors of a whole number through 50, and list factor pairs and determine if a one-digit number is a factor of a given whole number.

List the first ten multiple of a given one-digit whole number, determine if a whole number is a multiple of a given one-digit whole number.

Know that some numbers including 2, 3, 5, 7, and 11 have exactly two factors (1 and the number itself) and are called prime numbers.

Solve problems about factors and multiples.

Add and Subtract Whole Numbers

Add and subtract whole numbers fluently.

Multiply and Divide Whole Numbers

Multiply two-digit numbers by a one digit number, using the distributive property* to develop meaning for the algorithm*.

Example:

$$21 \times 3 = (1 + 20) \times 3 = (1 \times 3) + (20 \times 3) = 3 + 60 = 63$$

Algorithm:

$$\begin{array}{r} 21 \\ \times 3 \\ \hline \end{array}$$

$\begin{array}{r} 21 \\ \times 3 \\ \hline \end{array}$

Multiply fluently any whole number by a one-digit number, and a three-digit number by a two-digit number.

Divide numbers up to four digits by one-digit numbers and by 10.

Example:

$$6,035 \div 5 = 1,207 \quad 3,450 \div 10 = 345$$

Find the value of unknowns in equations.

Example: $a \div 10 = 25$, $a=125$; $125 \div b = 25$ $b=5$.

Solve applied problems involving whole number multiplication and division.

Estimate

Estimate the answers to calculations involving addition, subtraction, or multiplication.

Know when approximation is appropriate and use it to check the reasonableness of answers; be familiar with common place-value errors in calculations.

Make appropriate estimations and calculations fluently with whole numbers using mental math strategies.

Read, Interpret and Compare Decimal Fractions

Read and interpret decimals up to two decimal places; relate to money and place value decomposition. 2.43 is read as "2 and 43 hundredths". This is the same as \$ 2.43 where 2 represents whole dollars and 43 represents 43 cents.

Locate tenths and hundredths on a number line.

Read, write, interpret, and compare decimals up to two decimal places.

Example: $0.43 > 0.4$; $0.05 < 0.5$

Write tenths and hundredths in decimal and fraction forms, and know the decimal equivalents for halves and fourths.

Example: $.50 = \frac{1}{2}$ or $\frac{2}{4}$ $.25 = \frac{1}{4}$ $.75 = \frac{3}{4}$

Understand Fractions

Understand fractions as parts of a set of objects.

Locate and compare fractions on the number line, including improper fractions* and mixed numbers with denominators* of 12 or less.

Example: Find $\frac{3}{4}$ and $\frac{5}{4}$ on the number line.

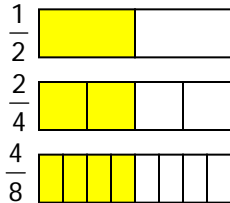
Which is closest to $\frac{1}{2}$? Which is closest to 1? to 2?

Find $\frac{5}{4}$ on the number line. Is it greater than, less than or equal to $1\frac{3}{4}$?

Understand the relationships among halves, fourths and eighths and among thirds, sixths and twelfths.

$$\frac{4}{8} = \frac{2}{4} = \frac{1}{2}; \quad \frac{8}{12} = \frac{4}{6} = \frac{2}{3}$$

Explain why these fractions are equivalent using fraction strips or the number line.



Write improper fractions* as mixed numbers, and understand that a mixed number represents the number of “wholes” and the part of a whole remaining.

Example:

$$\frac{5}{3} = \frac{3}{3} + \frac{2}{3} \rightarrow \frac{3}{3} = 1 \text{ therefore } \frac{5}{3} = 1 + \frac{2}{3} = 1\frac{2}{3}$$

Compare and order up to three fractions with denominators 2, 4, and 8, and 3, 6, and 12, including improper fractions and mixed numbers.

Example: Put these numbers in order: $\frac{5}{3}, \frac{2}{6}, 1\frac{3}{6}$.

Add and Subtract Fractions

Add and subtract fractions less than 1 with denominators through 12 and/or 100, in cases where the denominators are equal or when one denominator is a multiple of the other.

e.g., $\frac{1}{12} + \frac{5}{12} = \frac{6}{12}$; $\frac{1}{6} + \frac{5}{12} = \frac{7}{12}$; $\frac{3}{10} - \frac{23}{100} = \frac{7}{100}$.*

Solve contextual problems involving sums and differences for fractions where one denominator is a multiple of the other (denominators 2 through 12, and 100).*

Find the value of an unknown in equations such as $\frac{1}{8} + x = \frac{5}{8}$ or $\frac{3}{4} - y = -\frac{1}{2}$.*

Multiply Fractions by Whole Numbers

Multiply fractions by whole numbers, using repeated addition and area or array models.

Add and Subtract Decimal Fractions

For problems that use addition and subtraction of decimals through hundredths, represent with mathematical statements and solve.*

Add and subtract decimals through hundredths.*

Multiple and Divide Decimals Fractions

Multiply and divide decimals up to two decimal places by a one-digit whole number where the result is terminating decimal, e.g., $0.42 \div 3 = 0.14$, but not $5 \div 3 = 1.6$.

Problem-solving

Solve applied problems using the four basic arithmetic operations for appropriate fractions, decimals, and whole numbers.

MEASUREMENT

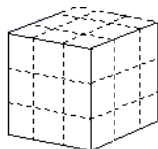
Measure using common tools and appropriate units

Measure using common tools and select appropriate units of measure. Give answers to a reasonable degree of precision.

Measure and compare integer* temperatures in degrees.

Measure surface area of cubes and rectangular prisms by covering and counting area of the faces.

Example: The surface area of one face of this cube is 9 square units. There are 6 faces that are all the same side so the surface area of the cube is 54 square units (9x6.)



Convert measurement units

Carry out the following conversions from one unit of measure to a larger or smaller unit of measure:

- meters(m) to centimeters(cm) $1 \text{ m} = 100 \text{ cm}$,
- kilograms(kg) to grams (g), liters (l) to milliliters (ml),
- hours to minutes, 1 minutes to seconds,
- years to months; 1 year=12 months
- weeks to days; 1 week=7 days
- feet to inches; 1 foot=12 inches
- ounces to pounds; 1 pound=16 ounces

Use Perimeter and Area Formulas

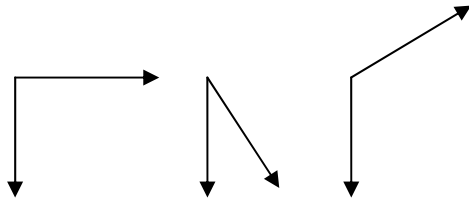
Know and understand the formulas for perimeter and area of a square and a rectangle; calculate the perimeters and areas of these shapes and combinations of these shapes using the formulas.

Find one dimension of a rectangle given the other dimension and its perimeter or area.

Find the side of a square given its perimeter or area.

Understand Right Angles

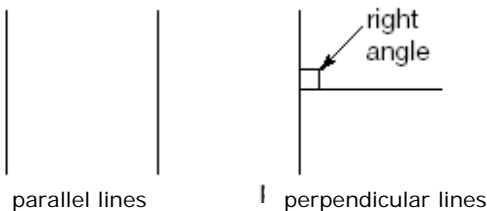
Identify right angles and compare angles to right angles.



GEOMETRY

Understand Perpendicular, Parallel, and Intersecting Lines

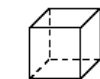
Identify and draw perpendicular*, parallel*, and intersecting lines using a ruler and a tool or object with a square (90°) corner.



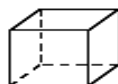
Identify basic geometric shapes and their components, and solve problems

Identify basic geometric shapes including isosceles*, equilateral* and right* triangles, and use their properties to solve problems.

Identify and count the faces*, edges, and vertices* of basic three-dimensional geometric solids including cubes, rectangular prisms, and pyramids*; describe the shape of their faces.



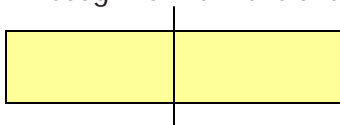
cube



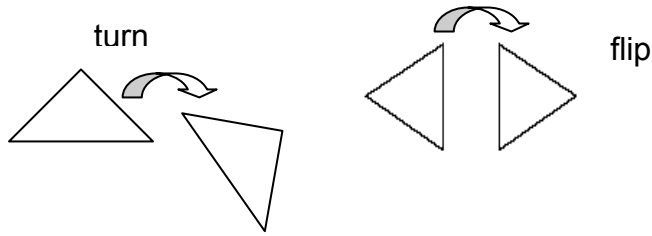
rectangular prism

Recognize symmetry and transformations

Recognize 2-dimensional figures that have line symmetry.



Recognize rigid motion transformations (flips, slides, turns) of a two-dimensional object.



DATA AND PROBABILITY

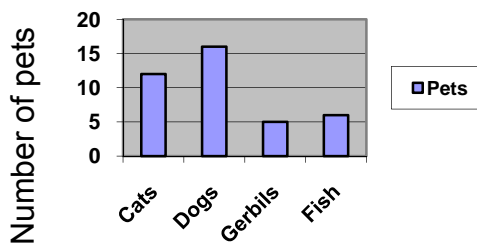
Represent and Solve Problems for Given Data

Construct tables and bar graphs from given data.

Example:

The students in Class A made a list of their pets: 16 dogs, 5 gerbils, 6 fish and 12 cats. Make a bar graph that displays the students list of pets.

Title: Students' Pets of Class A



Order a given set of data, find the median, and specify the range of values.

Example:

9,6,13,7,10,11,7 order numbers \rightarrow 6,7,7,9,10,11,13

9 is the median (middle number)

$13 - 6 = 7$

The range is the greatest number minus the least.

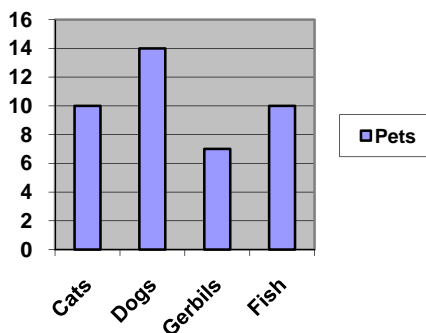
The range is 7.

Solve problems using data presented in tables and bar graphs.

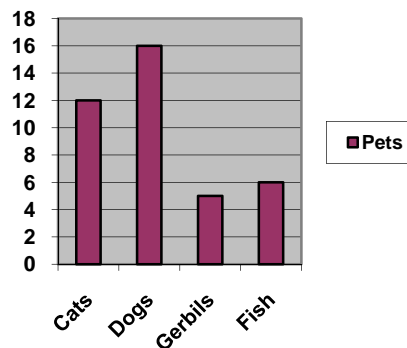
Example:

Compare data represented in two bar graphs and read bar graphs showing two data sets.

Number of Pets in Class A



Number of Pets in Class B



Which class has more dogs as pets?
How much more?

Which class has the most pets altogether?

* GLOSSARY TERMS

- **algorithm** – a specific step-by-step procedure for any mathematical operation
- **area** – the number of square units needed to cover the inside of a shape; rectangle, square, triangle, etc.
- **bar graph** – uses bars to show data
- **decimal** – a number that uses a decimal point to show tenths and hundredths Example: 2.43
- **denominator** – the bottom number of a fraction that shows the number of equal parts in a whole (In $\frac{1}{4}$, 4 is the denominator)
- **distributive property** – when multiplying any two numbers, the job can often be made easier by breaking (decomposing) the numbers into smaller pieces. The multiplication can then be *distributed* over those numbers. [$ax(c+d)=ac+ad$]
- **equilateral triangle** – a triangle whose sides are equal length and whose angles are equal measure
- **face** – the 2-dimensional side of a 3-dimensional figure
- **hundredth** – one out of 100 equal parts of a whole
- **integer** – positive and negative whole numbers
- **isosceles triangle** – a triangle with 2 sides of equal length and 2 angles of equal measure
- **numerator** – the top number of a fraction that shows the number of equal parts compared to the number of parts in a whole, (In $\frac{1}{2}$, 2 is the numerator)
- **parallel lines** – straight lines that are an equal distance from each other and never cross
- **perimeter** – the distance around the outside of a shape
- **perpendicular lines** – two lines which form right angles where they intersect
- **prime number** – a whole number greater than 1 that has only two factors, itself and 1
- **pyramid** – a 3-dimensional geometric figure whose base is a polygon (triangle, rectangle, etc.) and whose faces are triangular and meet at a common vertex
- **right angle** – an angle that forms a square corner; measures 90°
- **right triangle** – a triangle with a right angle
- **symmetry** – a shape or figure has symmetry if it can be folded along a line so that both parts match exactly.
- **Tenth** – one out of 10 equals parts of a whole
- **Terminating decimal** – a decimal that has a denominator that is a multiple of 10
- **Vertex (pl. vertices)** – the point where 2 lines, 2 sides of a polygon or 3 faces of 3-dimensional geometric figure come together.

Ways to Encourage Your Child...

You are doing a terrific job!

This is correct!

You are catching on quickly!

I am very proud of you!

You are making great progress!

Fourth Grade English Language Arts (ELA) is more than just reading and writing. It includes skills like speaking, listening, and viewing as well. ELA offers us a way to communicate. Through ELA, your child can apply what s/he learns to solve real problems at home, at school and in the community.



Glossary Terms

Words that have asterisks (*) are defined in the Glossary located at the end of this section.

By the end of the fourth grade, your child should know and be able to do the following:

READING

Word Recognition and Word Study

- Easily recognize familiar fourth grade words.
- Steadily increase the number of words that can be read fluently.
- Self correct and use fix-up strategies if a word does not sound right or make sense while reading.
- Use strategies to help figure out the meaning of unknown words and phrases.
- Fluently read fourth grade text and text that increases in difficulty throughout the year.



Narrative Text (Fiction)

Describe and discuss how the characters have similar experiences in literature from around the world.

Identify and describe a variety of genre* of narrative texts; poetry, myths/legends, fantasy, and adventure.

Identify and describe different story elements:

- what characters do and say
- who is the hero, villain, narrator
- what is the problem and solution
- know point of view* – first person tells story using *I, me, my*; third person tells story using *he, she, they*

Identify how authors/artists use:

- past (flashback*) or future (flash forward*) events to enhance the plot/story or create suspense.
- metaphor/simile* to compare characters or actions to other people or things.

Show through their discussions, drawings and writing that they know how two or more stories are connected.

Informational Text (Non-fiction)

Identify and describe the characteristics of informational text, such as autobiography/biography, personal essay, almanac, or newspaper.

Describe patterns found in informational text, such as compare/contrast, state a position and give supporting facts, or state a problem and identify a solution.

Explain how authors use indexes, headings, subheadings, notes in the margin, keys*, legends*, and bibliographies* to help readers understand key and supporting ideas.

Show through their discussions, drawings, or writing that they know how two or more stories are connected.



Comprehension

Use their own knowledge and experiences of the world to understand new ideas to connect themes* and ideas when reading texts.

Retell, using their own words, information and details from both fiction and non-fiction.

Compare and contrast relationships among characters, ideas, and events.

Connect and compare a story to their lives, to other stories, and to past events, and to other cultural situations.

Classify* and categorize* ideas and events within texts.

Ask questions while reading to check understanding.

Remember and use what is read in other subject areas, such as science and social studies.

Metacognition*

Know when they need help to understand what they read.

Know when they do or do not understand the texts.

Use simple strategies to increase understanding of texts, such as rereading.

Talk about why the author wrote the text – to tell a story or to give information.

Make predictions and draw conclusions while reading.

Create mental pictures of characters and events to improve understanding.

Ask questions before, during, and after reading.

Sort details and events to make charts, lists, and other graphic organizers*.

Use roots words, context clues*, and word endings to help figure out new words.

Discuss understanding of text with teacher and other students.



Ways to Encourage your child...

You are on the way!

You are doing so well!

This is great work!

Critical Standards*

Decide and discuss what qualities make a good story.
Create and use lists of standards, called rubrics*, to measure the quality of their own work and the work of others.



Reading Attitude

Be excited about reading and learning how to read.
Choose to read and write on his/her own during free time at school and at home.

WRITING

Writing Genre

Write myth/legend, fantasy, adventure stories that include characters, problem/solution, events in order, and a place/time for the story to happen that relates to a central theme or idea.
Write poetry based on reading a variety of grade level poetry.
Produce a compare/contrast essay based on a central theme, include supporting ideas, and show a clear sense of organization.
Use the steps in the writing process to produce and present a research project using a teacher-approved topic.



Writing Process

Think about the audience and the purpose of writing before beginning to write.
Draft stories using graphic organizers* to organize thoughts, ideas, and details.
Use a variety of sentence structures and vocabulary to construct clear, grammatically correct paragraphs.
Give specific suggestions to help others improve their writing, such as rearranging paragraphs, connecting main idea to details, using transition words*.
Edits own writing for errors in grammar, spelling, and sentence structure.

Personal Style

Develop a style where personality comes through. In fiction, use strong verbs, metaphors/similes*, and detailed descriptions. In non-fiction, use accurate details and clear transitions between ideas.

Grammar and Usage

Write complete, simple, and compound sentences using correct capitalization and end punctuation.
Use direct and indirect objects*, prepositional phrases*, and adjectives.
Use common and proper nouns as subjects and objects.
Use pronouns to refer to proper nouns.



Use apostrophes in contractions and commas to set off words, phrases, and dialogue.
Use quotation marks to identify titles or names.

Spelling

Correctly spell words often used in reading and writing.
Use letter sounds, word lists, word walls, dictionaries, and glossaries to figure out how to spell new words.

Handwriting

Use cursive writing often and be able to write neatly so that others can read it.



Writing Attitude

Be eager to write and learn to write.

SPEAKING

Conventions*

Use more complex ideas when speaking.
Change use of language for different audiences or different purposes. Example: Use of science vocabulary in science discussions.
Make presentations or reports using Standard English* or student's version of Standard English if student is in the process of learning English.
Be aware that language differs from region to region of the country and among different cultures.

Spoken Discourse

- Participate in discussions and share understandings about information learned.
- Tell or retell stories in an organized way that makes sense from beginning to end with details about characters, setting, events and themes*.
- Plan and deliver informational presentations and reports in an organized way that includes a key question or idea and provides supporting facts or details.
- Give presentations or tell stories using appropriate facial expressions, hand gestures, and body language.



Ways to encourage your child...

You have a great imagination!

You are doing so well!

I am so proud of you!

This looks great!

LISTENING AND VIEWING

Conventions*

Respond to questions when asked, providing additional information and details as needed.

While in large and small groups, pay attention and listen carefully to others.

While in conversations, use eye contact and pay attention to the speaker.

Be able to identify different ways of communicating, such as persuade, flatter, explain, and challenge.



Response

Choose, listen to, or view and discuss a variety of good books, both classic and recently written.

Make connections between two or more stories by discussing, drawing pictures, or writing about them.

Retell in own words major ideas heard in messages and presentations.

Use two or more strategies together to respond to text. Example: Listen to a story then give an opinion orally, or read text and write a summary.

* GLOSSARY TERMS

- **bibliography** - list of the resources referred to in a text, essay, or report
- **categorize** - organize ideas, events, objects, or people into groups based on common features
- **context clues** - hints from the surrounding words, phrases or sentences about the unknown word
- **conventions** - the rules about how words and language works when speaking or writing
- **critical standards** - the high level of quality students must be able to recognize to determine if their work will meet expectations
- **direct (indirect) object** - a noun or pronoun that receives the action of the verb. Indirect objects are what receive the direct objects. Example: *Ted gave Ms. Smith an apple.* direct object – apple indirect object – Ms. Smith
- **flashback** - literary device that tells events that have happened in the past
- **flash forward** - literary device that tells events that will happen in the future
- **fluency (fluently)** - ability to read text accurately and quickly
- **genre** - a category used to describe different kinds of texts, such as poetry, fantasy, legend
- **graphic organizer** - a form or pattern that is used to organize information
- **key** - tool that gives an explanation of symbols or abbreviations on maps, charts, or graphs
- **legend** - tool that gives information or explanation about symbols used on a map or chart.
-



- **metacognition** - the process of thinking about one's own thinking. Example: Being able to know when they do or do not understand what they are reading.
- **metaphor/simile** - figures of speech in which two things or ideas are compared. Metaphors compare two things in such a way as to imply that one is another. Example: *The fog is a wet blanket.* Similes use words such as "like" or "as" to compare. Example: *The fog is like a blanket.*
- **point of view** - the viewpoint from which a story is told
- **prepositional phrases** - a group of words that usually indicate a location. Example: in the sky or under the table
- **rubric** - a scoring guide to assess student performance
- **Standard English** - the form of English widely accepted as being clear and understood
- **theme** - the central idea or message in a piece of writing
- **transition words** - words used to tell the order events happened or to move from one idea to the next in writing. Examples of transition words are *first, then, next, afterwards, following, and finally.*

Study Tip...

Get organized. Keep all your homework supplies in one place, ready to be used. Try to keep your supplies in a box or other container so that you will have all that you need when you are ready to study.