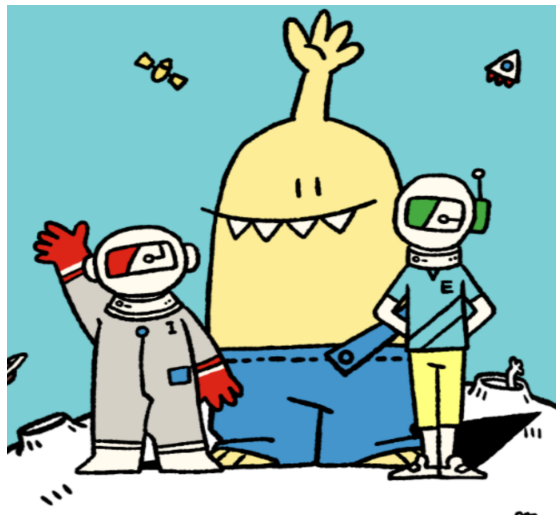# SEKOLAH ENUMA

A digital education solution for young Indonesian children

Learning, Design, and Curricular Framework

About Enuma

Enuma, Inc. is a leader in developing digital, early-learning solutions with a proven track record of successfully using gamification for self-directed learning. Enuma creates exceptional learning solutions designed to help all children gain confidence and independence while building foundational skills in early literacy, math and English as a Foreign Language. Our award-winning products include Todo Math, Todo English, and Kitkit School, which was named a winner of the prestigious US $15 million Global Learning XPRIZE competition in 2019. Sekolah Enuma was developed for Indonesia and is the first release from our latest product series, Enuma School. Visit enuma.com and sekolahenuma.com to learn more.

Mission

The name *Enuma* comes from the word enumerate, or to name one by one, which underscores our commitment to every child's individual success, including children with special needs or without resources, gifted children, and children with unique learning styles.

First Edition, 2022

Foreword

Sekolah Enuma helps Indonesian children learn better and supports the development of Pancasila learners. The curriculum of Sekolah Enuma is aligned to the National Curriculum and designed to give children a strong foundation of building 21st Century Competencies to enable them to take advantage of opportunities in the digital age while learning languages, literacy, numeracy, and intellectual and character development.

Sekolah Enuma's Benefits to Children
- Children will acquire a strong foundation of Bahasa Indonesia and basic English competencies. Bahasa Indonesia has its own rules and conventions which is enriched by various vernacular vocabularies and wisdom. English is a valuable asset to enabling them to survive in a global environment, in business, science and technology.
- Children will develop literacy skills that include the capacity to read, understand and critically increase different ways of communication including spoken language, printed text and digital media.
- Children will develop their numeracy skills and confidence to use, interpret and communicate mathematical information to solve real-life problems, which include the ability to understand basic addition, subtraction, multiplication, and division.
- Character development is facilitated through different learning experiences that focus on instilling Pancasila values. These are the "six main characteristics of Pancasila learner(s) ...: 1) faith, being devoted to God Almighty and having noble character, 2) global diversity, 3) mutual cooperation, 4) independence, 5) critical reasoning, and 6) creative thinking" (Ministry of Education and Culture Regulation Number 22/2020). These six main characteristics are embedded in the learning activities, books and high-quality videos that are based on children's daily life and culture.

Valuable Learning Experiences through Play and Active Learning with Sekolah Enuma
- Meeting the needs and interest of the children
- Inviting, encouraging, exciting and challenging
- Engaging and inspiring children
- Stimulating curiosity and exploratory abilities
- Developing critical reasoning and encouraging creativity

Content
The content is designed, produced and optimized to promote creative learning experiences on the basis of self-learning activities, which is in line with and optimizes the Indonesian primary school curriculum. For example, the Indonesian language curriculum includes early digital literacy, punctuation and text comprehension.

Assessment

Sekolah Enuma moves beyond tests and examinations, and uses appropriate assessment modes to support children's learning. It integrates digital assessments to measure children's competencies and children are allowed to revisit their own progress at their own pace.

I hope that all Indonesian children are capable of reaching their full potential when given the proper digital technologies and learning experiences towards building 21st century lifelong learners.

Ella Yulaelawati PhD
Former Director, Ministry of Education and Culture (2006-2018), and Founder, Yayasan Rumah Komunitas Kreatif (YRKK)

Executive Summary

Sekolah Enuma is an innovative digital application developed by Enuma, Inc., that teaches young children Indonesian, English, and math through games with thousands of fun learning activities and hundreds of books and videos. Aligned with the National Curriculum up to Second Grade, the program is designed for early learners to master foundational skills in the three subjects. Inclusive of young learners and those with little exposure to formal schooling, Sekolah Enuma also includes a digital literacy curriculum to orient children to digital learning, as well as early childhood content.

The Indonesian curriculum starts with introducing the alphabet and then gradually provides children with the skills needed to encode and decode words. From simple to increasingly complex word constructions, the curriculum ultimately advances to reading and comprehension of simple books. Similarly, the English curriculum also covers the alphabet and advances to simple sentence construction, while continually exposing children to new vocabulary and conversational phrases to boost their confidence in learning a foreign language. The math curriculum builds from counting and simple operations to multiplication and word problems.

Developed by a team of local educators in collaboration with a global team, the curriculum includes over 70 books by local storytellers and illustrators that highlight *Pancasila* principles along with a collection of videos about local folktales and folk songs. Sekolah Enuma also integrates concepts of social emotional learning, environmental stewardship, and positive self-concept into its activities, books and videos.

Through in-app placement tests and quizzes, review units and a tightly scaffolded curriculum, Sekolah Enuma individualizes children's experience so each child learns at the right level and moves at the right pace for them. Developed by expert game designers, Sekolah Enuma also applies Universal Design for Learning, so that each child can learn in the manner that best suits their learning needs or style. In addition to being individualized, Sekolah Enuma's design also heavily emphasizes engagement and motivation. Through discovery learning and self-directed learning, Sekolah Enuma aims to engage children and empower them to lead their own learning journey. In fostering this confidence and building their curiosity, Sekolah Enuma not only supports immediate acquisition of early literacy skills, but also fosters a lifelong love of learning.

With Sekolah Enuma, children learn through playing and exploring, thus they are encouraged to be voluntary learners. Sekolah Enuma's materials are attractive and cover many variations, finely arranged throughout the curriculum to maintain children's motivation. Other than supporting the acquisition of the literacy basic competences based on the National Curriculum, the existence of Sekolah Enuma is useful for Indonesian children's cognitive and character development, expanding their knowledge and increasing their self-confidence.

- Suri Meidianshari, Sekolah Enuma, Curriculum Designer

Sekolah Enuma Indonesia offers a unique learning approach that helps improve children's literacy both at home and in school. Its fascinating visuals, represented in games, videos, and books, can stimulate children's imagination and creativity, which eventually lead them into cognitively mastering the language and mathematical skills. I am optimistic that many children from various backgrounds can benefit from Sekolah Enuma Indonesia, since imagination and creativity are universal and fundamental in enhancing learning experiences.
- Rima Muryantina, Sekolah Enuma, Curriculum Designer

Sekolah Enuma is a learning app designed for Indonesian children which provides wonderful and enjoyable learning experiences. Children can learn independently at their own pace through thousands of fun activities from hundreds of games, books, and videos that are finely structured based on Indonesian national curriculum. With unique visuals and a distinct learning approach, I believe Sekolah Enuma will strengthen Indonesian children's ability to ensure optimum results in their learning process.
- Nesia Anindita, Sekolah Enuma, Regional Content Manager

Introducing Sekolah Enuma

Images: The opening screen and main menu of Sekolah Enuma

Sekolah Enuma is an innovative digital application that teaches young children Indonesian, English as a Foregin Language, and math through thousands of fun learning activities and hundreds of books and videos. The program is designed for early learners to master foundational skills in the three subjects. Aligned with the National Curriculum through the second grade, Sekolah Enuma allows children to access high quality early literacy content from a mobile phone or tablet.

The program individualizes each child's experience. Through placement quizzes and levelling activities, children's path through the program is adapted for them to best learn. The program places them at the appropriate level, provides review when needed, and challenges them with new material when they are ready. Sekolah Enuma also provides opportunities for children to choose which activities they want to play, encouraging engagement and therefore optimal learning.

In addition to being individualized, Sekolah Enuma is also an independent learning tool that children can use without requiring constant adult support. Though constant teacher-led instruction is not required, teachers and other facilitators can help set-up and support children's use of Sekolah Enuma using its Learning Management System (LMS).

Sekolah Enuma can be played on a mobile phone or a tablet device. With internet access, it can sync learning data to the LMS for monitoring children's progress. However, an ongoing Internet

connection is not required for children to use Sekolah Enuma. This helps make Sekolah Enuma particularly useful in low-connectivity areas.

Sekolah Enuma has been designed for use in a variety of settings, including in schools as part of class time or after-school programs. It can also be used in non-school settings as part of informal learning programs, as well as directly by families to support their children's learning. Given the flexibility of where and how Sekolah Enuma can be used, it is a powerful tool for children to access learning opportunities regardless of their individual circumstances or local situations.

Sekolah Enuma Highlights:
- Allows children to continue learning regardless of their own, or the world's, circumstances.
- Has proven success in achieving both literacy and numeracy gains for children learning on their own.
- Is usable in different communities, including those with zero to limited internet access. The program is digital but not necessarily online.
- Runs on smartphones and tablets; no additional data usage is required once installed.

Sekolah Enuma's Building Blocks

Sekolah Enuma is a thoughtfully designed system organizing and coordinating thousands of learning activities comprised of:

Games - Hundreds of games with thousands of learning activities teaching Indonesian, math and English. Each game supports a specific learning goal, such as practicing simple addition or learning letter sounds.

Videos - Hundreds of videos supporting the three subjects, too. Our videos are created with a variety of formats proven to be engaging and effective for teaching children, including live-action, animation, puppets, and stop motion.

Books - Hundreds of books in Indonesian and English, and several cross-curriculum books about math as well. Books have a read aloud function and are paired with comprehension quizzes that help children focus on reading skills by recalling key details of the text.

These games, videos and books appear in both the program's Learning Course and Digital Library. The organized Learning Course supports children to achieve specific learning goals in a series of curated activities, while the Digital Library allows children to freely explore the games, videos, and books.
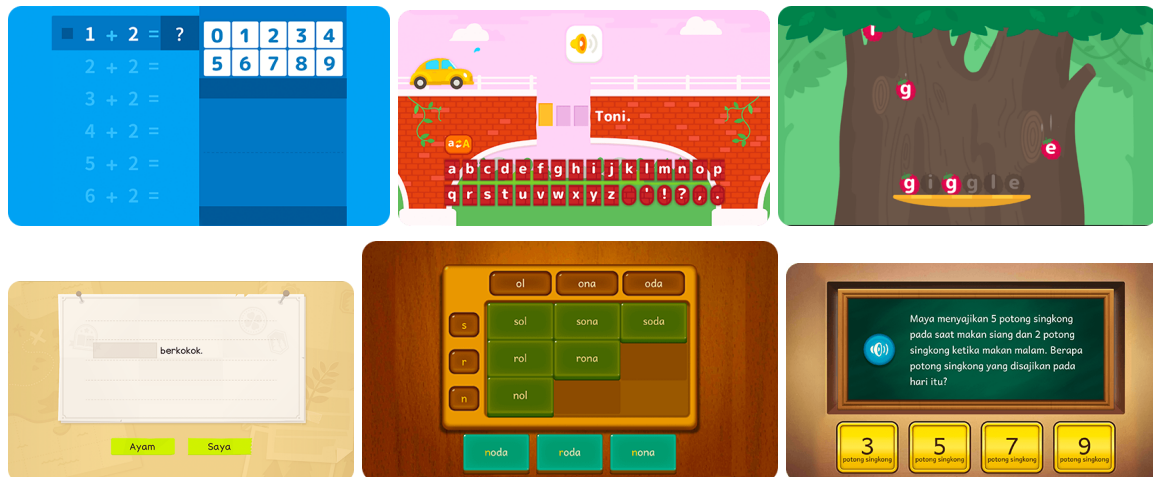
Images: games from Sekolah Enuma

Images: Videos from Sekolah Enuma

Two raindrops.
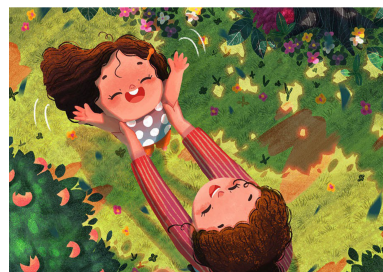

I see animals with black and white stripes. What are they?

The blue-and-yellow-striped puppet is very special. As you can see, it is a baby bird puppet with nice, big eyes. Any kid would love that puppet. It is my best baby bird puppet. I will sell it to you for only seven dollars.

"Tapi, kita ikut antri ya," kata Dini.

Binbin pasti bisa jadi apa saja.

"Nah, sekarang tentang Papua!" Nelce menunjuk halaman setelahnya.

Ada hutan tropis penuh dengan burung beraneka ragam. Hutan sagu yang menjadi sumber makan warganya. Ada laut biru yang indah seperti pada Raja Ampat di Papua Barat.

Images: Books fromSekolah Enuma

The Sekolah Enuma Learning Course and Digital Library

Image: The main screen of Sekolah Enuma showing the three subjects: Indonesian, math and English

The Learning Course is the main component of the Sekolah Enuma application. It is based on underlying curriculum maps with detailed learning objectives that are each supported by specific games, books and videos. Children's mastery of the learning objectives is periodically assessed through quizzes within the application. These assessments direct the program to provide review units to those children who need additional practice. As children go through the Learning Course, they progress through increasingly difficult and complex content.

The Digital Library (or library) contains all the games, videos and books that suit a child's particular level, and are organized by content type: games, videos and books. Playing in the library supports every child's learning journey as more practice and play consolidates their knowledge acquisition.
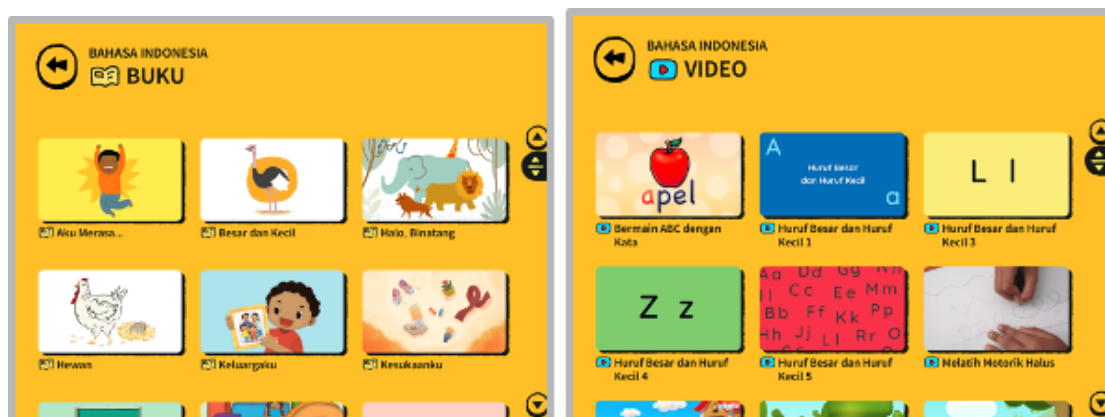
Images: The book and video libraries of Sekolah Enuma

Individualized Learning Journeys

The program organizes a unique learning path for each child in each subject: Indonesian, math, and English as a Foreign Language. After playing through digital literacy activities that appear at the start, all children will take the in-app placement test for each subject. This placement test determines where to place a child, whether at the beginning levels for each subject, or to jump a child to a later point in any subject to better fit their current learning level. All children are placed on individual learning paths to best fit their unique starting points. With the placement tests and the in-app quizzes, they progress through curriculum and content that best suits their individual needs.

At any time, children can play games, read books, or watch videos in the Digital Library, or they can move back to the Learning Course and play any subject they choose. Children decide which subject and activities they want to play with first, too. Providing children with the choice of what subjects and activities they would like to play, within their unique learning paths, helps to sustain their engagement with choice and empowers them to drive their own learning. Children can move through our system in a wide variety of ways, all supported by our curriculum and guided by their choices.

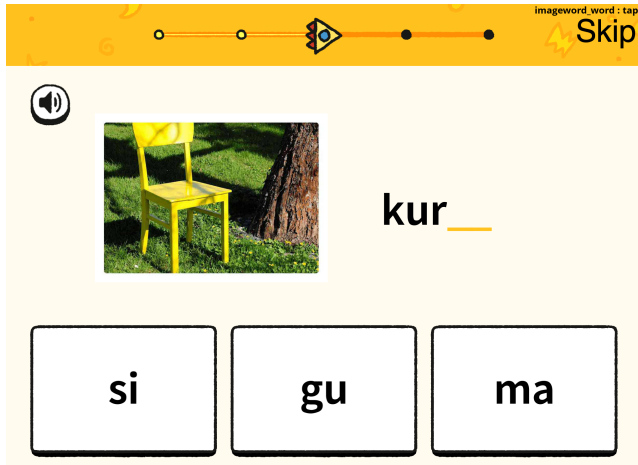Image: Child taking the digital test in West Java, Indonesia

Image: A question on a Sekolah Enuma placement test for Indonesian

Structured Learning Course Supports Specific Learning Goals

The Learning Course is the backbone of Sekolah Enuma's comprehensive system that is coordinated, systematic, and built on clear learning goals. It is organized by: Daily Lessons, Units, Levels and Courses.

-

Image: A Course Map

Image: A Level Map

Daily Lessons

A "Daily Lesson" in each subject is a suggested set of games, books and videos that support a particular learning objective, and is organized so that children can complete it withinseveral minutes of play. As children progress through the Daily Lessons,they move to more difficult and complex content. The content is tightly scaffolded so children progress steadily through the learning goals in a supportive manner. This tight scaffolding helps pace content, particularly for struggling learners.
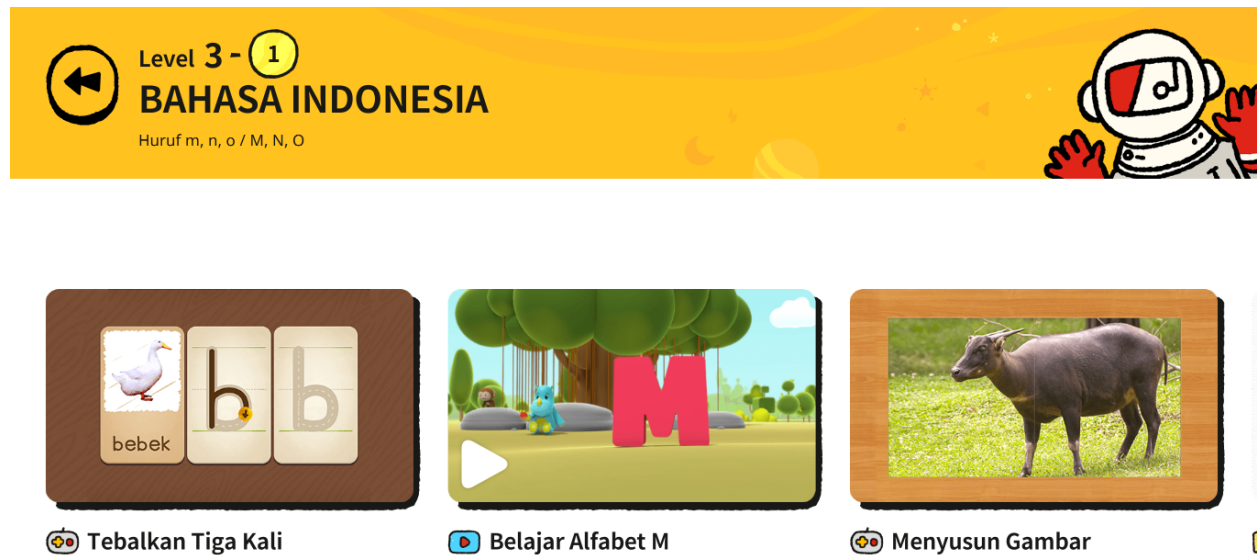
Image: A Daily Lesson in Bahasa Indonesia subject

Units, Levels and Courses

Units are made up of groups of Daily Lessons, and have their own overarching learning goals. Groups of Units form a Level, and Levels form a Course. The organization of Units, Levels and Courses are carefully designed for practice and repetition, providing different activities for the same curricular targets. This design most effectively engages children and helps them learn. For example, if our curricular target is a set of five vocabulary words, we may include the words in: a book with a story that incorporates the vocabulary, speaking games, listening games, model conversation videos, and a spelling game. Units, Levels and Courses also have built-in assessment to gauge retention of the curriculum. The program then presents additional practice for those learners who need it.

Supporting Learning Success Through Assessments and Review

Image: A Unit quiz within Sekolah Enuma

Assessment

There is a robust assessment system within Sekolah Enuma to help ensure that each child is being presented with the most appropriate curriculum for their learning level. A placement test discovers a baseline of learning for each child. Then Unit and Course Quizzes determine whether children are ready to move on to the next level, or whether they need more review and practice. The system adapts to each child depending on their quiz performance. Even within the same class of students, each child's daily progression might be different depending on the results of those assessments, thus encouraging students to progress at their own pace and with confidence.

Pre and Post Assessments

Sekolah Enuma also includes assessments to help gauge the relationship between the students' use of the Sekolah Enuma program and their learning gains. These assessments are referred to as the "pre- and post- digital assessments". While included within the application, they are gated and must be administered by a teacher or facilitator. The Indonesian and Math assessments were developed by Enuma with consideration of the Early Grade Reading Assessment (EGRA) and the Early Grade Math Assessment (EGMA). The English as a Foreign Language test was also developed in alignment with EGRA, but with consideration of second language learning.

Review Units

Based on Unit and Course quiz results, some children will be presented with review units that provide additional practice and review of curriculum that they have not mastered. Review units consist of more games, books, and videos practicing the same curriculum but in a different order with different games so children get new practice, stay engaged, and feel progression in their play. By not feeling failure or being penalized, children can do

the work they each need individually to arrive at the same successful learning outcome. They feel equally confident in their abilities to learn. With this, Sekolah Enuma hopes to inspire them to continue their learning along whatever path best suits their learning style whether it takes more practice time or not.

Curriculum Boosts

While the Learning Course follows a clear structure of lessons and units, some units have "curriculum boosts" presented as additional games, videos, books, or activities that provide a learning boost. They support students to best meet learning objectives of tricky concepts, such as extra practice or additional explanation. They are also periodically added for engagement and fun to encourage children to keep playing and boost their motivation. They also provide brain breaks. Research has shown that brain breaks help children learn. During breaks, our brains process learning, make connections, and consolidate learning.[1]

Supporting Educators: Sekolah Enuma Learning Management System (LMS) and Administrator Tools

Images: The Sekolah Enuma Learning Management System

---

[1] Immordino-Yang, MH, et al. 2012. "Rest Is Not Idleness: Implications of the Brain's Default Mode for Human Development and Education." Perspectives on Psychological Science, Vol 7, Issue 4.

The Sekolah Enuma Learning Management System (LMS) is an additional web-based tool that administrators, teachers, facilitators, IT officers and others can use to manage, monitor and evaluate various aspects of the Sekolah Enuma program.

The Sekolah Enuma LMS includes features to:
- register students' information
- form users into classes
- monitor students' progress in the Sekolah Enuma app

It is intended to help organizations facilitate setup and manage the use of Sekolah Enuma with multiple students.

Administrator Tools
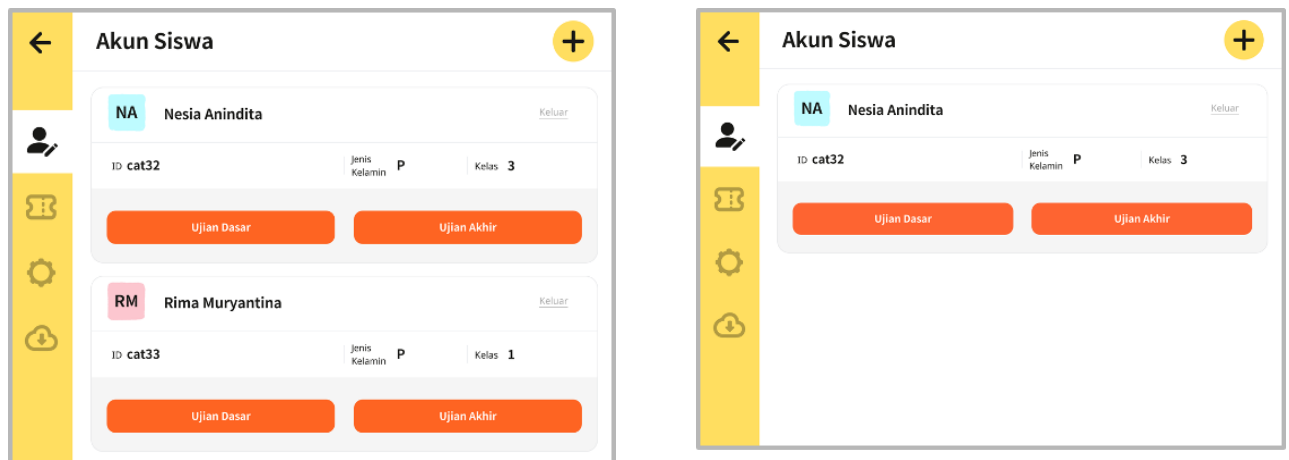
images: Administrator pages within the App

The Sekolah Enuma application also includes Administrator tools in a gated area of the application for adults to help them easily manage the Sekolah Enuma program. Features in the Administrator Settings include access to the student accounts screen, pre- and post-assessments, volume controls and data sync management.

Sekolah Enuma Curriculum and Content

Overview

The curriculum and content of Sekolah Enuma is based on leading research, best practices, well-researched standards, and expert input, as well as interactive learning design principles. A team of global and local Indonesian education experts developed the curriculum and content

to be in line with the National Curriculum (2016) and also research on and the realities of the diverse educational needs across Indonesia. The curriculum and content aims to support children in not only well-resourced learning environments, but also remote and harder to reach, high-needs areas.

In addition to the main curricular subjects of Indonesian, Math and English as a Foreign Language, Sekolah Enuma also includes curriculum for digital literacy as well as early childhood education.

Digital Literacy

Sekolah Enuma is designed so that young children can use the touchscreen and interact with the content independently. Children's ability to use the application independently helps build their confidence in using digital tools. The application is intuitive for young children to use, and the early level activities help young children learn to comfortably engage with interactive digital media.
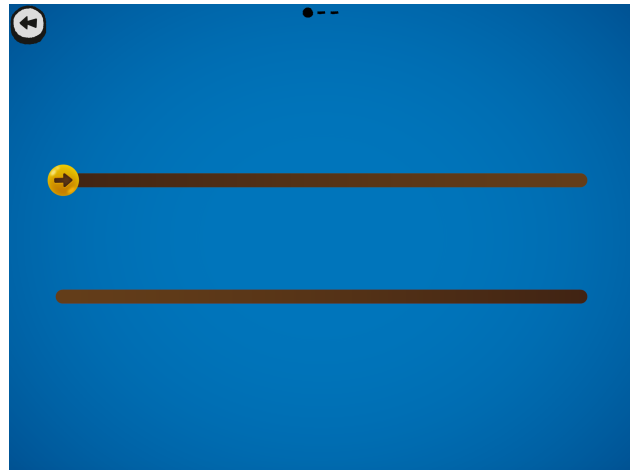
Image: Example of a game to teach child how to trace on a tablet of rmobile device.

All children must play through a few digital literacy games when they first start with Sekolah Enuma. Very young learners, or those new to interactive digital media, will play even more games that teach them how to trace, drag and drop, and tap before they can move on to learning activities that teach more academic knowledge and skills. Sekolah Enuma also contains games that teach children how to use a number keypad and how to type using a keyboard.

Early Childhood Learning

Image: an early childhood game to support visual discrimination

Before learning literacy and numeracy skills, children must build foundational skills in visual discrimination, working memory, pattern-making, and spatial experiences. For example, before learning letters or characters, children must understand and distinguish images and icons. As children learn how to trace and draw, they build important fine motor skills for future writing.

Sekolah Enuma includes several games that allow children to practice these early childhood learning skills. For example, in a matching game, children connect similar objects, which helps to hone their visual discrimination. Most of the early childhood learning games then evolve from early childhood content to early learning content. For example, instead of matching a cup to a cup (as in the image below) children will match the letter A to the letter A. By using the same game rules for early childhood content and subsequent early academic content, the application helps scaffold children's learning. Since they do not need to learn new game rules when introduced to early educational content, children can focus solely on learning the new information.

Indonesian Curriculum

Sekolah Enuma's Indonesian curriculum helps children learn foundational literacy and develops their reading, writing, speaking and listening skills. Building from our award-winning Kitkit School literacy curriculum, Sekolah Enuma's literacy curriculum covers content from early childhood learning through second grade, in alignment with the National Curriculum (2016). In Sekolah Enuma's literacy curriculum, children will encounter dozens of learning games and hundreds of books and videos spread across approximately two years of content.

Sekolah Enuma's Indonesian curriculum starts with a focus on the alphabet including each letter's name, shape, and sound (phonics). The next several levels focus on supporting children to decode and encode words. This helps children to understand the parts of words, such as syllables, and to place them together to create simple words with meaning. After a focus on simple words, children progress to learn more difficult words and sounds, including harder syllables with diphthongs and digraphs.

While learning to encode and decode simple to more difficult words, vocabulary is always taught in the context of meaning. If children are exposed to a word, they are often shown a visual for the word (whole word to image) which places the word in context. This builds children's understanding that learning to read and write is part of communication and conveying meaning, and it adds motivation for learning to read and write. In Sekolah Enuma, children are exposed to high-frequency words. They are also given opportunities to study different forms of words, such as verb tenses which can be challenging for young learners. The literacy curriculum includes games that support skills particularly important to Indonesian, such as a game on learning words with chunkingand a game to learn Indonesian affixes.

After the early curriculum's focus on word construction and high-frequency words, children transition from practicing simple sentences to creating more difficult sentences and short paragraphs. They learn rules around sentence formation, including capitalization, spacing and punctuation.
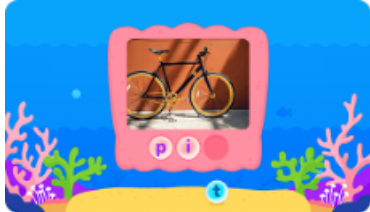
The key literacy learning areas covered by Sekolah Enuma include:
- Alphabetic principle
- Phonics and phonological awareness
- Vocabulary
- Familiar and high-frequency words
- Reading fluency
- Reading comprehension
- Listening comprehension
- Syntax
- Daily expressions and courtesy
- Print awareness (including cursive font)
- Writing

Sample Indonesian Games

Below is a selection from the dozens of Indonesian games in Sekolah Enuma. Please refer to Appendix 2 for a detailed game list.

	Game Title	Description	Learning Goal

1	Letter Tracing	Trace the letters, listen to, and see images of relevant alphabet vocabulary.	Practice letter writing while building vocabulary.
2	Spelling	Look at the image and listen to the word to complete the spelling.	Build vocabulary and practice spelling skills.
3	Bird Phonics	When the game starts, each bird says its phonics sound. The user chooses the bread with the right phonics for the right bird. When the user touches the bread and bird, the sounds are spoken.	Phonics Vocabulary
4	Missing Words	Use the image and sentence context to drag the correct words to complete the sentence.	Enhance reading comprehension and vocabulary
5	Explain to Me	Help the Cat Detective to find the right word.	Enhance syntax and question comprehension

Indonesian Books and Videos

Sekolah Enuma's Indonesian program contains over 300 videos and 200 books to support children's reading and writing skills. Early level books include simple alphabet books that help children learn vocabulary associated with letters. One-word books help children practice reading simple words, and it helps to familiarize them with print awareness while also building their vocabulary. The books increase in difficulty, and ultimately children are exposed to books with multi-sentence paragraphs.

Sekolah Enuma contains 74 books that were specifically designed in consideration of the local context. They were modeled on the values outlined in the Indonesian character education empowerment movement, a national movement which has played an important role in the country's education strategy. The purpose is to equip young Indonesians with the spirit and values of Pancasila (the founding principles of Indonesia) which the government has highlighted to help students face the challenges of the future. These values include independence, nationalism, religiosity, harmony, mutual cooperation, and integrity. They are embedded in books through exciting and engaging stories that are based on Indonesian children's daily life, culture and habits.

For example, in the Indonesian book *Aku dan Temanku*, we introduce children to a story of friendship between two very different children. Even though they look different and like different things, it does not prevent them from forming a very special bond of friendship. This book supports the Indonesian value of mutual cooperation, and through it children learn about tolerance and respecting others. This also aligns with Enuma's curriculum for diversity and inclusion, as well as global citizenship.

Also, new books highlight the diverse regions of Indonesia and showcase different cultures and ethnic groups. There are also books about national heroes such as Indonesia's first president, Soekarno.

Images: The books include topics specific to Indonesia, such as a book about Indonesia's marine life and a book about different varieties of Indonesian traditional dances.

Some Indonesian books were tailored to highlight certain basic competencies according to the National Curriculum, such as getting to know poems and Indonesian rhymes, describing objects, learning daily greetings, showing courtesy when asking favors, inviting and rejecting, recognizing a formal announcement, and showing a personal experience written in cursive font. The competencies are served with content that matches Indonesian cultural and moral values.

The videos in the Sekolah Enuma library include songs from eight different local languages across Indonesia, as well as a video about greetings in different religions. Given the many natural disasters in Indonesia, our video library includes a series of preparedness videos for children covering volcanic eruptions, tsunamis, earthquakes, floods and landslides. Each animated video is packed with interesting graphics and a storyline to explain each disaster and raise children's awareness to be well-informed and better prepared.
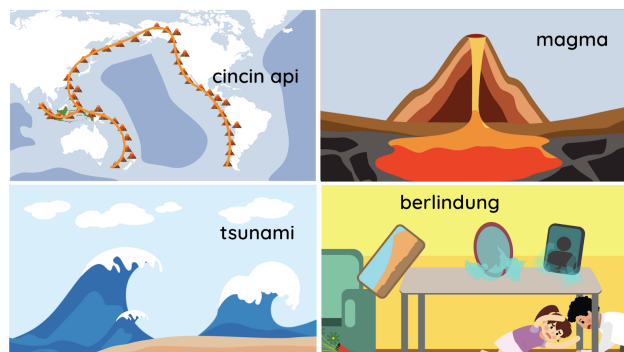
Images: The video library includes videos about disaster risk reduction, as well as videos that explain Indonesian phonics.

Math Curriculum

Sekolah Enuma's math curriculum is designed to help early grade students build their competencies in foundational math skills and concepts, such as number sense, operations, and shapes. Sekolah Enuma's math curriculum has been developed from Enuma's years of experience creating the internationally award-winning application, Todo Math. As with the Indonesian curriculum, children will encounter thousands of learning activities and videos that can span 2 years of play.

Sekolah Enuma's math curriculum follows a developmentally appropriate approach and is aligned with leading research, standards, and expert input. It aligns with the National Curriculum for math for early childhood through Grade 2. In Sekolah Enuma, math goals are introduced in a gradually challenging way. As children advance through the units, they encounter similar games at more difficult levels, as well as new games to address complementary skills. This provides a spiraling sequence to help children build on their Math knowledge.

At early levels, children begin by playing games focused on pattern recognition and visual processing with shapes. Next, they are introduced to counting, writing, and representing numbers up to 10 and eventually to comparing and ordering numbers. Students count the number of items, learn number sequences, and evaluate magnitude by counting in order. They also learn skip-counting, as well as the concept of place value in two-digit and three-digit numbers. Children also practice addition, subtraction, and multiplication, starting with simple problems and working up to more complex ones. For shapes, connections are made between shapes and the appearance of everyday objects so that students easily understand the characteristics of specific shapes. Students also learn the names of basic two-dimensional and three-dimensional shapes, how to categorize them, and how to recognize their attributes.

The key math learning areas covered by Sekolah Enuma include:
- Counting
- Number identification
- Number sequences
- Quantity discrimination
- Place value
- Addition, Subtraction, and Multiplication
- Shapes
- Mathematical reasoning
- Telling time

Sample Math Games

Below is a selection from the Math learning activities in Sekolah Enuma. Please refer to Appendix 2 for a detailed game list.

	Game Title	Description	Learning Goal
1	Counting	Count the number of objects and tap the corresponding number.	Practice counting and build number sense through objects and number pairing.
2	Number Tracing	Practice writing and counting numbers to 110.	Practice writing numbers up to 110.
3	Feeding Time	Explore the concept of comparing numbers (greater than, less than, equal to) and quantities as you feed the hungry monster.	Magnitude comparison of two numbers up to three-digit numbers
4	Froggy Hop	Practice multiplication facts with the jumping frog.	Practice multiplication.
5	Shapes Matching	Identify 2D and 3D shapes by name, orientation, and relationship to everyday objects in this fun matching game.	Shape Recognition Shape Naming Shape Matching

Math Videos

The math curriculum also makes important links to literacy through books and videos about numbers, number operations, shapes, and word problems.

Sekolah Enuma has over 80 math videos which include songs that help children memorize core math concepts like number names, shape names, and multiplication tables, as well as instructional videos that help explain how to add, subtract, multiply, identify shapes, and tell time.
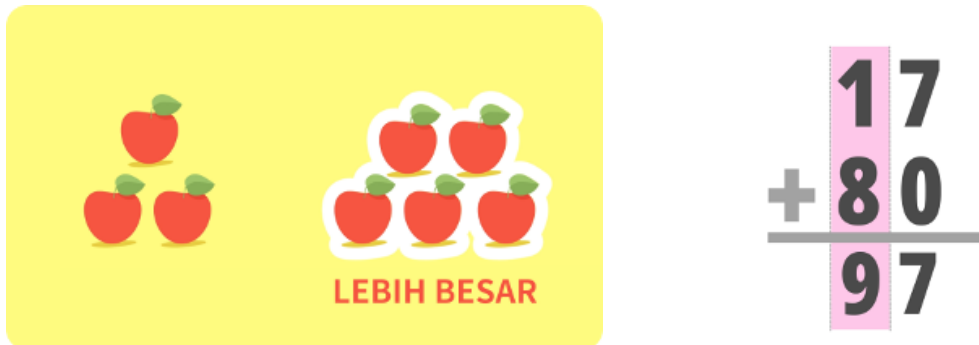
Images: The Sekolah Enuma Video library includes videos that teach quantity comparison and how to add double-digit numbers by regrouping

English as a Foreign Language Curriculum

The Sekolah Enuma English curriculum is created from leading English as a Foreign Language (EFL) research, United States Common Core Standards for English language learners, and classroom best practices. Its comprehensive system of English learning that includes developing reading, writing, listening, and speaking skills. As with the other subjects: Indonesian and Math, the English curriculum has thousands of learning activities, and hundreds of videos and books that can support a child for more than 2 years of play.

The English curriculum covers content up to Second Grade in an English medium school, which often corresponds to EFL learning in early elementary schools globally. Along with the core language learning curriculum, the English program is also focused on building children's confidence and excitement for foreign language learning.

The early curriculum levels focus on introducing the name, sounds, and shapes of the English alphabet. This early curriculum is coupled with exposure to category words that are of interest to young children, such as colors, animals, fruits, and feelings. Children also learn groups of the most common words in the English language as they progress through Sekolah Enuma English. After building a strong foundation in English phonics in the early levels, children are exposed to blending and word study, and eventually to simple sentences and syntax.

Exposure to language in meaningful contexts is an important part of the curriculum. The program's videos and read-aloud books improve children's oral vocabulary and conversation skills. Even from early levels, children are introduced to simple conversational topics such as greetings and self-introduction, as well as engaging stories and characters to motivate them to keep learning and solidify key learning objectives.
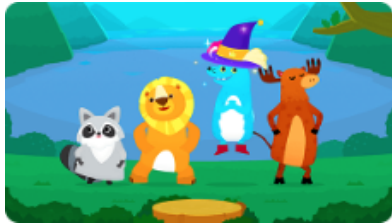
The key English as a Foreign Language learning areas covered by Sekolah Enuma are:
● English alphabet
● American English phonics
● Alphabet vocabulary
● Common vocabulary
● Category vocabulary
● Listening skills
● Reading skills
● Writing skills
● Speaking skills
● Basic sentence construction
● Grammar
● Common phrases and greetings
● Common conversation skills
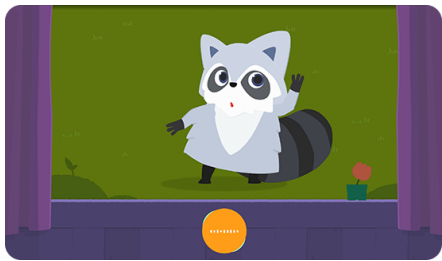
Sekolah Enuma English aims to inspire confidence, excitement, and enjoyment of language learning while giving children the opportunity to build a strong foundation in English. It also hopes to inspire children to continue to learn English after they've completed the Sekolah Enuma program.

Sample English Games

Below is a selection from the English games in Sekolah Enuma. Please refer to Appendix 2 for a detailed game list.

	Game Title	Description	Learning Goal
1	Jewel Miner	Tap the letters that are the same as the ones in the cart.	Recognize letters. Listening comprehension.

2	Sentence Maker	Complete the sentence by dragging the correct word into the space.	Build reading comprehension and vocabulary while practicing sentence construction.
3	Silly Hat	Listen to the animals say words and move the silly hat to the animal that isn't saying the same word as the others.	Practice listening skills.
4	Sorting Rockets	Drag the words within the same category into the rocket.	Build understanding of category vocabulary as a foundation for improving reading comprehension.
5	Talking Racoon	Listen to what the Racoon wants and help repeat it back.	Encourages speaking as well as pronunciation practice.

English Books and Videos

Sekolah Enuma English contains over 250 videos and over 200 books. The library includes a wide range of books across 7 levels that cover kindergarten to 2nd grade reading in an English medium school. These books help children practice new vocabulary, basic sentence construction, and common phrases in English. Books in our program also include comprehension quizzes to help children confirm their reading comprehension skills, key vocabulary mastery, and grammar learning.

Images: Sekolah Enuma includes simple one-sentence books as well as multi-sentence conversational books.

The videos help provide exposure to pronunciation, common phrases, conversations, and vocabulary. Like the books, they also help make English language learning more engaging and fun for young children.
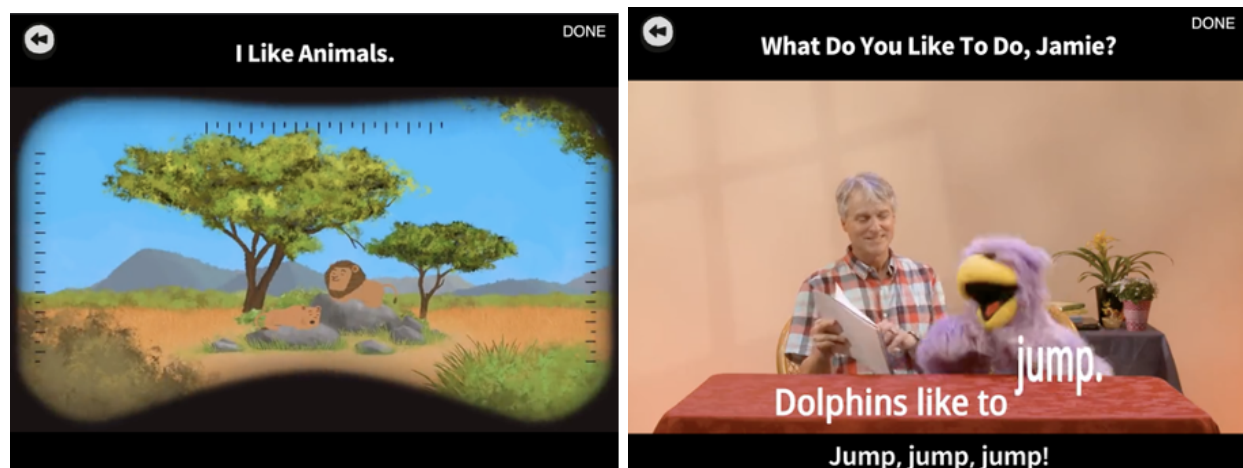
Images: English Videos introduce category vocabulary, such as animals, and conversational topics like wants and likes.

Sekolah Enuma Learning Design

Enuma's Learning Philosophy

There are three key principles that are core to all our products.

All children deserve access to high-quality learning experiences. In order to achieve this goal, the ability for children to learn independently is critical. So, we create programs in which a child anywhere, regardless of their abilities or prior knowledge, can access and learn. All our products are designed so that young children who are illiterate or have little digital experience can still learn from them independently. We do this by including an abundance of non-text visual guidance as well as video examples to reach students who are unable to read. All of our products have multiple starting levels, so children can begin at the correct level that suits their unique learning needs.

In education, one size does not fit all. Every child is unique and achieves success in a different way. A single sequence of activities won't serve all children, especially those with special learning needs. A single pace won't allow all learners to master the skills and knowledge they need to reach their fullest potential. So we create programs that meet the individual needs of each child. Within our system, we build guided choices, so that children are empowered to decide what next step to take on their own learning journey. All the choices support our learning objectives, and also support different learning styles. So no matter the path or sequence, all children will learn with different paths.

An engaged learner is a successful learner. Because of this, our programs are designed with motivation as a central feature. All aspects of our programs aim to engage and motivate players to continue. Our brains are wired to learn. They respond to new patterns and information with feelings of joy, encouraging us to seek out new skills and knowledge. We can help children's early learning, and help them develop positive learning habits, by making the learning experience more engaging and enjoyable. We engage children through fun games, books and videos, scaffolded learning, immediate feedback, and a gamified reward system. Children earn rewards for completing activities, and carefully designed, non-distracting animations throughout the application add appeal while children play.

Enuma's Game Design Philosophy

Enuma's proven design methods come from years of expertise and experience in delivering high-quality learning products to young children around the world. This expertise sets Enuma apart from other educational software. These design methods are core to all our products, including Sekolah Enuma. Please refer to Appendix 3 for information on other Enuma products.

WHERE DOES FUN COME FROM? A GAME DESIGNER'S PERSPECTIVE ON ENGAGEMENT

Children often receive messages from adults that education is not meant to be fun—only endured. Just as game designers aim to create fun games that compel players to continue playing, successful educators know that engaged learners are dedicated learners. But where does fun come from? What can education game designers do to increase engagement and learning?

In developing Sekolah Enuma, our team sought to better understand how to support children to develop a lifelong love of learning. We turned to leading research on early childhood development. We looked for best practices in literacy and numeracy education. And, because of our experience as game designers, we looked for insight there, too.

In his book *The Theory of Fun for Game Design*, renowned game designer Raph Koster described the fundamental relationship between games, learning, and fun. "Fun in games," he wrote, "arises out of mastery. It arises out of comprehension. It is the act of solving puzzles that makes games fun." We feel fun in response to learning new information, recognizing patterns, and mastering skills—an evolutionary adaptation that aided human survival by rewarding exploration, discovery, memory, acquisition, optimization, socialization, and competition.

Yet, even game designers like us know better than to assume that learning is always fun in the same way or fun at all. (We remember our college physics classes!) Many subjects—especially academic subjects—are too complex for our brains to discover the patterns that normally trigger a neurochemical reward.

In Sekolah Enuma, we sought to encourage children to persist through the curriculum by deepening engagement. Our literacy and numeracy curriculum translates challenging concepts into bite-sized skills, helping children discover the patterns that make language and mathematics mastery possible. Our Learning Course and DigitalLibrary give children the autonomy to control their learning within Sekolah Enuma. They choose which games and activities to play, which videos to watch, and which books to read.

Our goals are not the traditional goals of game designers. We're not designing just for fun or player retention. We're trying to equip children in developing countries with high-quality learning resources. But providing those resources alone isn't enough to increase global literacy and numeracy. Children have to carry through the curriculum. By designing for fun and considering learners' experiences, educational game developers can lead children to deeper learning.

Core Principle: Engagement & Motivation

To sustain engagement for such a long period of time, during development we prioritized children's short-, mid-, and long-term experiences rather than short bursts of explosive fun.

Short-Term Fun: The Joy of Solving Problems

The invention and widespread adoption of touch screen devices created exciting opportunities to help young learners around the world. By removing the need for typing skills, touch screens enabled young learners to access educational software.

Because our goal is to bring high-quality learning materials to all children we thought carefully about how to quickly engage young learners by creating a highly intuitive interface through:

- **Realistic Look and Feel.** We created digital objects that look and react in familiar ways to help young learners build understanding.
- **Digital Manipulatives.** We translated existing learning manipulatives into digital versions (e.g., realistic sounds of a pencil scratching the paper when tracing letters on the screen, the click of a wooden puzzle piece placed in its correct spot).
- **Proportionate Responses.** We leveraged digital audio and visual cues to encourage and reward children's progress (e.g., a voice reading out the letter that is highlighted, an explosion of sparkles when a learner makes a correct response). But, we thought carefully about making responses proportionate to players' achievements.

In addition, to ensure the overall experience allows users to feel short-term fun, we applied the following elements:

- **Speedy Progression.** Short, easy-to-understand actions minimize transition time and get learners to their desired destination quickly. Sequences are kept short, transitions quick, and music and effects concise. For nearly all interactions, users can quit the activity immediately.
- **Clear Feedback.** Users receive clear feedback to indicate success. When a child succeeds, they receive delightful visual and auditory cues. A gentle screen vibration indicates a child has answered incorrectly.
- **Ease to Success.** Learners who know the correct answer are able to complete the activity easily. Puzzle pieces brought close to their correct spot, snap into the right place. When appropriate, answering multiple-choice questions incorrectly removes the incorrect answer from the remaining list of choices.

Mid-Term Fun: System Design and Content

Crisp, responsive interactions can delight a user in the short-term and allow them to enjoy playing for longer durations. But as users become familiar with game patterns, they can become bored. How can we ensure the user, who is going through a repetitive system is engaged every day?

- **Variable Rewards.** In his book *Hooked*, Nir Eyal describes how successful startups use four stages to develop habit-forming products that hook users:[2]
    1. Trigger
    2. Action
    3. Variable Reward
    4. Investment

    By linking learning to conspicuous rewards, learners are encouraged to continue pursuing their learning goals. Sekolah Enuma builds engagement by displaying assets they earn throughout gameplay. As a user progresses through the curriculum, they earn stars and badges.

---

[2] Eyal, Nir. 2014. *Hooked: how to build habit-forming products.*
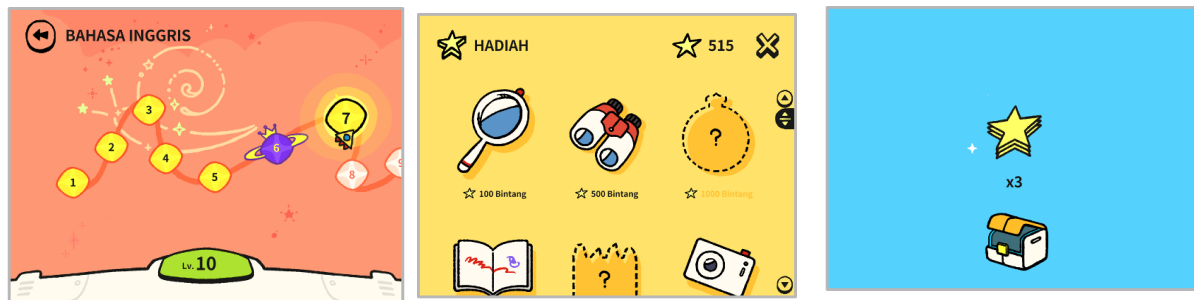
Images: rewards within Sekolah Enuma

As children complete Activities and Lessons, they earn stars. When children complete a certain number of Lessons, they earn constellations. These stars and constellations encourage children's play in the short and medium term. Longer term, children earn badges for their achievements. Once children obtain a certain number of stars, they earn a badge. They also get badges for reaching certain levels and for reading a certain number of books.

- **Fresh Content.** New games featuring new patterns are introduced throughout our programs to deepen user engagement. We strive to provide fresh, high-quality learning content in new ways as users continue through our programs.
- **Clarity of UI.** A clear user interface helps users quickly understand where they are and how much they have progressed through the curriculum. Menus are clear to prevent confusion about their location.
- **Diversity.** Once users become familiar with patterns, they quickly lose interest. Sekolah Enuma games provide a wide array of game play patterns, graphic styles, and learning challenges. We worked with illustrators, actors, and animators with a wide variety of styles to develop a broad range of educational books and videos.
- **Removal of Barriers.** When users encounter problems that they cannot solve or become frustrated by repetitive games, they lose interest. By analyzing user data, we update games to create a more engaging experience and support users to advance through the curriculum.

Long-Term Fun: Supporting the User's Goals

Each Sekolah Enuma user's ability, interests, and goals will be different. By reflecting on the diversity of our users, we can design long-term fun. We asked ourselves, "What is the user's goal of learning?" and "Is there a way to understand and better support their goals?"

To answer these questions, our team borrowed from a practice commonly used in video game design: identifying player categories. In his 1996 article, "Hearts, Clubs, Diamonds, Spades: Players who Suit MUDs," Richard Bartle proposed that players follow different approaches when playing a game, which related to their personal style (action vs. interaction and world-oriented

vs. player-oriented).[3] Drawing from our experience designing learning apps for children and by analyzing user-generated data, we identified four player profiles reflecting children's different approaches to learning.

Understand Patterns for How Children Learn in Educational Software

	Weak Motivation	Strong Motivation	
	Socializer	High Achiever	Others
	Comfort Seeker	Self Motivator	Self

Image: children playing with Sekolah Enuma in Lampung, Indonesia

Each Sekolah Enuma user's ability, interests, and goals will be different. Drawing from our experience designing learning apps for children and by analyzing user-generated data, we've identified four player profiles that reflect children's different styles of learning.

- **High Achievers:** High Achievers are eager to make progress, as defined by the rules of the game. They enjoy learning and completing activities. They feel confident and motivated because of their quick success and rapidly expanding skills. High Achievers are motivated to keep practicing and learning when they can show their progress to peers, receive in-game rewards, and meet time challenges.

- **Self Motivators:** Self Motivators are equally as motivated as High Achievers, but their goals aren't focused solely on completing in-game goals, like finishing all Courses. They set and pursue their own goals, such as reading all the books in the library or watching all the learning videos. The game industry refers to this type of player as a "collector" because they enjoy collecting proof of their progress. If the system offers various activities, we expect Self Motivators to identify what they want to collect and pursue that goal.

- **Socializers:** Socializers play games to be a part of the community and their progress often aligns with that of their peers. We believe peers can be powerful motivators for this

---

[3] Bartle, Richard. (1996). "Hearts, clubs, diamonds, spades: Players who suit MUDs."

player type. To encourage group play, we provide clear, easy-to-understand rules and the freedom to choose games and activities. After completing a lesson in Sekolah Enuma, a map appears on screen before a child begins their next lesson. The map shows how much they've progressed in that unit so far, which helps them track their own progress and motivates them to continue. Children can work alongside and together with friends in our program if this is their key motivation.

- **Comfort Seekers:**
  Comfort Seekers enjoy Sekolah Enuma because they find they can build their confidence by succeeding at early-level activities. While working on Todo Math, our award-winning math product for young children, our team has found that some children have low confidence in their learning ability due to a fear of failure. Sekolah Enuma's child-directed approach helps Comfort Seekers build confidence by replaying what they know until they are ready for a challenge at a more advanced level. Regardless of their age or learning level, all children begin Sekolah Enuma by playing through a few levels of digital literacy activities to help build their confidence. After completing the digital literacy activities, children will take a placement test which automatically appears for each subject as part of their Learning Course.

Enuma's Design Methods

Design Method 1: Self-Directed Learning

As described above, our products are built on self-directed learning. We define self-directed learning as learning that empowers children to choose their own learning path, pace, and duration of engagement. We believe that when children determine their own pace and path, they are set up to succeed. Each child's experience within our products is unique; the program meets children where they are in their learning, which we believe is critical for understanding. Children are encouraged to play and learn with minimal direct instruction. Enuma gives children the freedom of choice in their education.

Self-directed learning provides the best learning for children by keeping them engaged, motivated, having fun, and experiencing low stress. (Willis, 2007). Our products are built to delight, motivate, and engage our learners. We do this through careful consideration of all of our individual learners at every point in the experience. Fun, ease of use, support, and success are all purposefully built into our system.

Self-directed learning shows children their own inherent ability to acquire knowledge. This fosters self-confidence in children as lifelong learners. They are not being compared to their peers but rather following the best learning path to mastery for their own unique needs and interests. They are able to proceed without worrying that their pace is too slow, that their peers' accomplishments are greater than theirs, or that their grades are bad. Children think, *"I can*

learn. I can do it. I can figure things out on my own." By choosing their own learning paths, which books to read, and what games to play and replay, children will develop preferences, areas of interest, and intellectual curiosity. We see that offering children choices in their learning paths helps spark the curiosity that will evolve into lifelong learning.

Design Method 2: Discovery Learning

Enuma product design is inspired by Jerome Bruner's Discovery Learning Model which highlights the importance of students constructing their own knowledge independently through education sessions that are well-designed, highly experiential, and interactive. The model describes how instructional opportunities can benefit from stories, games, visual aids, and other attention grabbing techniques that will build curiosity and interest.

Another principle of the Discovery Learning Model is failure and feedback; learning doesn't only occur when we find the right answers. Bruner emphasizes the importance of a carefully designed spiraling curriculum, with gradual levels of difficulty, building on previous knowledge to allow children to learn independently. And in our systems, there is a low cost of failure. Games are the core of our curricula where children develop and practice literacy, numeracy, and English as a Foreign Language skills through play. Games are unique in that nobody fails in Enuma's design; children may not pass the game in their first attempt, but they have unlimited chances to play until they succeed. Klopfer et al.(2009) claims that games imply a low stakes learning environment as they allow multiple attempts to solve problems and provide different routes to achieve goals. In order to pass the current level, children are prone to think about the gap between the current attempt and the successful one, and that is when learning occurs (Squire, 2005). Children might perceive their unsuccessful attempts as failure, yet such in-game failure does not bring substantial consequences to the gameplay, thereby players consider it as a natural step to success (Gee, 2007; Lee & Hammer, 2012). Therefore, all children gain confidence in our system as learners, motivating them to continue to play and therefore learn. Regardless of initial failure and possible need for more practice, all children are encouraged and can succeed in our system.

Enuma designs for discovery learning through carefully constructed games, videos, and books in a spiraling curriculum through a highly visual, tactile, touch-screen experience. Through the learning games, children discover patterns. When they play different games that explain the same concept, their understanding of that concept is reinforced. Enuma design also supports learners through failure and feedback. When students answer incorrectly, the program gently guides students to try again in a supportive and feedback-rich environment. In our design, we also try to minimize learners' cognitive load; we focus each game around a single learning goal and design a sequenced curriculum to help students build and retain knowledge. Through this discovery-based, self-directed approach learners are more likely to remember concepts and newly acquired information.

Design Method 3: Universal Design for Learning

Image: A math game in Sekolah Enuma that provides children with multiple ways to show their understanding of the concepts

UDL is an important part of all our design because it optimizes instruction and learning for all children. Central to the UDL framework is a flexible and accessible design whose target is not limited to the average child. Rather, it accommodates all learners including those with special needs.

We ensure that our products incorporate UDL principles for developing curriculum and learning experiences to meet the diverse requirements of all learners including those with special needs. The UDL framework, first defined by David H. Rose, Ed.D. of the Harvard Graduate School of Education and the Center for Applied Special Technology, calls for creating curriculum that provides:

- **Representation***:* We give learners multiple means of learning key objectives. Through a variety of games, books, and videos, we present curricula in both auditory and visual ways. We give children experiences with different modalities. We also account for unpredictable factors, such as children's hearing abilities, device volume, and ambient noise levels by minimizing the conveying of information solely through audio.

- **Expression**: Sekolah Enuma provides learning through different receptive and productive activities for learners including reading, writing, listening, speaking, and problem-solving.

- **Engagement:** The program uses a variety of games and a gamified achievement system. It also meets learners where they are in their development, so the program's learning fits them 'just right.' This supports a child's success and bolsters confidence.

Through the development of Enuma's educational products, we've tested and observed our learning design with a population of children with a high variability of learning abilities, including learning difficulties, intellectual disabilities, or stimulation sensitivity. We have added special features so we can accommodate as many children as possible, such as providing various ways to input an answer for Todo Math, and careful attention to what fonts are best for all children. This is an area of special expertise for us.

Design Method 4: Universal Themes

We deliberately choose universal themes so that children can relate to our products. Sekolah Enuma is framed by a "Space" theme, with rockets, planets, astronauts and fanciful creatures. Space and the sky are universal elements for all children.

By using a consistent visual design , Sekolah Enuma helps children focus on the learning content and reduces their cognitive load. Backgrounds were chosen to be simple, to not interfere visually, and to emphasize the key learning goals.

The Space Theme
By choosing space for Sekolah Enuma, we hope to inspire children to become interested in space and technology. When a child sees the astronaut characters, they can visualize themselves under the helmet. They can imagine themselves exploring space. Lastly, the sky represents the lack of limits we believe all children can have if given the opportunity to learn: 'The sky's the limit."
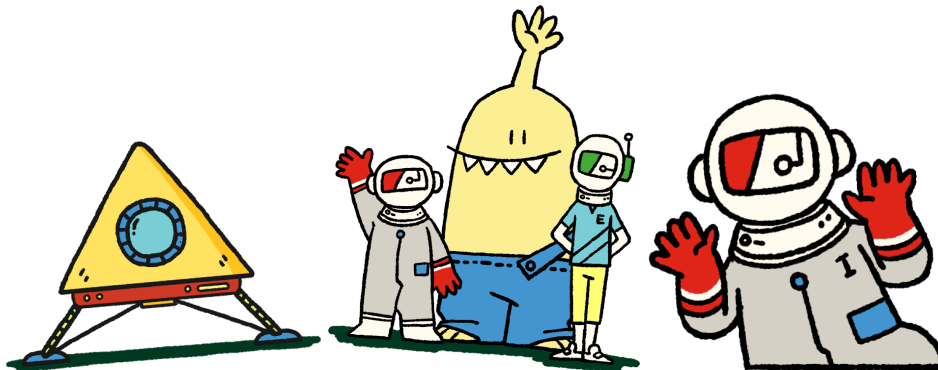
Design Method 5: Empowering Children Everywhere

Besides embedding the Indonesian culture and context in our learning activities, books, and videos, Enuma incorporates content focused on empowering children, which includes global citizenship, social emotional learning and diversity and inclusion.

This content maps to Sekolah Enuma's Hidden curriculum, which refers to the unwritten lessons, values, ideas, and perspectives that students learn through any kind of experience. Without conscious thought or direct instruction, hidden curriculum lessons are transmitted through games, books, and videos. Therefore, we carefully consider all that our program transmits. Below are a few examples showing how we incorporate our hidden curriculum with our literacy, math and English curriculum.

How does our Hidden Curriculum appear within Sekolah Enuma? Below are some examples.

- **Social Emotional Learning:** In our English as a foreign language section, there is a 'daily stage' where Sekolah Enuma students have brief interactions to model functional language. Through these character interactions, manners and respect are shown as part of natural conversations.
- **Positive Self-Concept as Learners:** We create carefully-designed wrong answer responses to inform children of their mistake, support them toward the correct answer, and build each child's self concept as a confident learner. By contrast, a very punitive wrong answer system may transmit that children are failures.
- **Diversity & Self-Concept:** When we represent people in our program, we include assistive devices as well as diverse people as regards to body shape, height, skin color, hair, and other characteristics. In doing this, we hope to promote acceptance of differences, and positive self-concept for each individual. When children can see themselves within empowered positions or characters, it helps them build positive self-concept.
- **Stewards of the Environment:** We include books and videos that explicitly focus on the wonders of Nature and taking care of our Earth while teaching key literacy concepts.
- **Manners and Respect:** We model in our books, videos, and games how people of all ages have manners and respect. With Sekolah Enuma, we have a deep cultural review to ensure that what we show aligns with the manners and respect for each culture that we enter.
- **Global Citizenship:** We include books with stories, characters, and natural wonders from around the world. This helps children to gain awareness of themselves as global citizens, a part of a global community. Additionally, by sharing such material, we hope to help them gain appreciation for the world outside their own communities

Design Method 6: Data and Feedback Driven Design

Understanding and empathizing with our users is core to the success of all of our products.. We approach every project with flexibility and open minds about how best to reach our users. Our mission is to create programs that best support conventional and unconventional learners to build a strong foundation in literacy, math, and English as a Foreign Language. We are, therefore, continuously evolving our products based on data and feedback to better support struggling learners. We are a nimble, data-driven team. We try new methods, ideas, and curricular content, test the efficacy and improve based on quantitative data and qualitative observations and feedback. We believe this will help us improve the educational opportunities for the many children around the world we hope to help.

We bring our ongoing learnings from all of our products to every new program we create, while always remaining open and curious about how to best reach any new groups of learners.

Case Study: Sekolah Enuma in Lampung and Medan

In January 2021, Sekolah Enuma was tested for three months in Medan and Lampung. The Enuma team and its partners ran this field test with 586 students from kindergarten to 3rd grade from primary schools. The main goal of the field testing of Sekolah Enuma was to receive feedback from children and stakeholders, such as parents, community leaders, teachers, and nonprofit organizations' staff. Based on observation of children's use and their feedback, the Enuma team has examined the efficacy and engagement of the application. In addition, the user data collected during the testing was analyzed to improve the features of the product and the curriculum. The feedback from stakeholders informed the program implementation models and potential support resources for program administrators. During the testing period, teachers and NGO staff provided feedback on adult-facing functions, such as the learning management system (LMS).

Testing Site 1: Medan
The first testing site of Medan, the largest city in the North Sumatra province, was in an out-of-school environment in partnership with the nonprofit organization, Food for Hungry Indonesia (FH Indonesia). FH Indonesia selected Deli Serdang communities, a semi-urban area where they have been working with more than 300 households, for the beta testing. FH had been implementing community-based education programs aimed at increasing school readiness for the young children of these households. Households in Deli Serdang are generally financially supported by salaried work (factories, plantations) or agricultural work. Most families have access to electricity and cell phones. In light of the COVID-19 pandemic, the children in Deli Serdang have been out of school for more than one year due to continued school closure. For the beta testing, FH Indonesia recruited 130 children from kindergarten to 3rd grade. The FH team utilized its existing program to facilitate the Sekolah Enuma learning sessions at their Kids Clubs. The Kids Clubs are the community centers in the sub-village level where children gather for after school learning activities and playing with peers.

Testing Site 2: Lampung
Enuma intended to test the use of Sekolah Enuma in a school classroom setting at Gunung Madu Plantation (GMP) and PSMI (Pemukasakti Manisindah) primary schools in Lampung. There are 10 schools in the plantation communities. The team selected three primary schools and the initial plan was to schedule learning sessions during school hours in a regular class timetable, with a daily 30-minute session.

However, due to the COVID-19 pandemic, the schools were closed during the project period and teachers provided remote learning via parent's mobile devices. To adjust, Sekolah Enuma sessions were hosted in community halls located in the housing complex. A total of

456 students enrolled in grades 1 and 2 participated in the program. Following the COVID-19 health protocols, the students were placed in small groups and assigned to one-hour sessions.

Data Collection and Learning Assessment Findings
During the field testing, Enuma collected data from the following sources:
- Observations by facilitators
- Log data uploaded from devices (game data)
- Surveys and interviews with parents, teachers, community, and stakeholders
- Learning assessment data (analysis of pre- and post-test results).

After reviewing the learning assessment data from the pre and post tests, we discovered that all post-test scores increased from pre-test scores in both regions. In both Lampung and Medan, average post-test scores increased from pre-test scores. The average total percent of correct answers for Lampung students increased from 73% to 78% in literacy, 53% to 59% in math, and 44% to 55% in English. In Medan, the average of student's total percent of correct answers increased from 47% to 53% in literacy, 41% to 53% in math, and 25% to 29% in English.[4]

---

[4] Tests include timed sections that observe how many questions children can answer within a period of time, thus it is not realistically expected that children would attain a 100% in correct answers on the tests.

Mean Percent Correct, Lampung

Mean Percent Correct, Medan
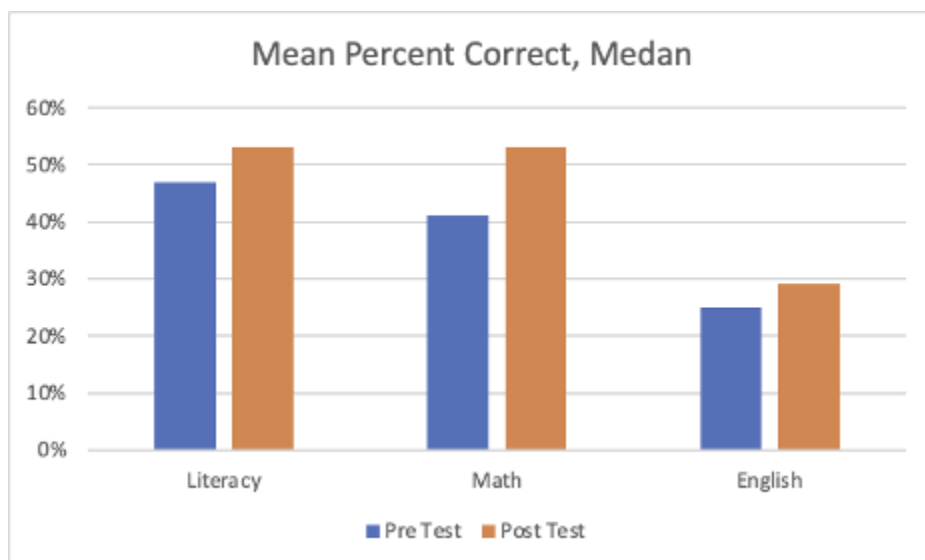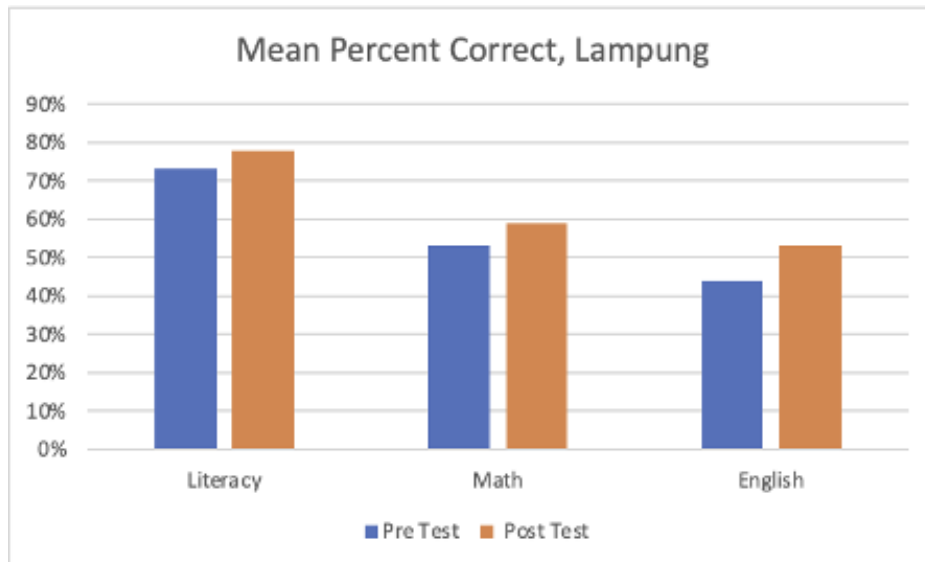
Quotes from Children in Medan and Lampung, Indonesia

"Sekolah Enuma seru sekali, aku bisa belajar sendiri."
Sekolah Enuma is really fun, I can learn on my own.
(Girl, Medan, age: 9)

"Karena permainannya bagus, ingin belajar dan ingin pintar, biar nanti kalau sudah besar, menjadi tambah pintar"
Because the games are good. [I] want to study, and become smart, so that when I grow older, I become smarter.

(Boy, Lampung, age: 9)

"Saya senang karena belajar dengan bermain."
I'm happy because I study while playing.

(Girl, Lampung, age: 9)
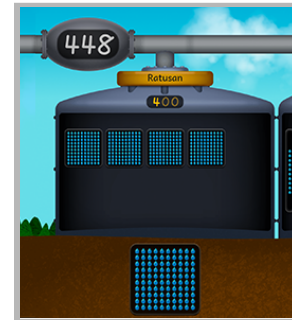
Appendix 1

Sekolah Enuma: Learning Objectives

Learning objectives are also extensively reviewed and updated to map to the Indonesian literacy curriculum, math teaching in Indonesia, and native language interference for English as a

Foreign Language. Cultural updates are made throughout as well. Below are updated Learning Objectives for Sekolah Enuma Indonesia by subject. To reiterate, these objectives will evolve for each country or region that implements Sekolah Enuma.

Sekolah Enuma: Literacy Learning Objectives
The Indonesian Curriculum aligns with the basic competencies and character education of Indonesian National Curriculum for early childhood through 2nd Grade.

Course	Level	Learning Objective
Course 1	Level 1	Get started with digital literacy and get to know lowercase and uppercase letter shapes
	Level 2	Recognize letters A-L & a-l
	Level 3	Recognize t letters M-Z & m-z
Course 2	Level 4	Identify vowel and consonant letter sounds
	Level 5	Read basic syllables formed by a vowel and a consonant
Course 3	Level 6	Read familiar words of 3 to 4 letters Identify initial and final sounds in a word
	Level 7	Read familiar words of 5 to 8 letters Identify middle sounds in a word
	Level 8	Read words with double consonants Read words with diphthongs
Course 4	Level 9	Understand text-sound-image of familiar words about body parts, feelings, food, drinks, animals, plants, colors and numbers
	Level 10	Understand text-sound-image of familiar words about clothing, home, school, places, vehicles, times of day, weather and actions
Course 5	Level 11	Recognize words as elements of a sentence: pronouns, verbs, modals, affixes and classifying words
	Level 12	Recognize words as elements of a sentence: adjectives, positions and time
	Level 13	Practice sentence elements
Course 6	Level 14	Understand making of simple sentences Recognize the correct use of punctuation and capitalization
	Level 15	Understand making of sentences with details of position or time, negation, questions, and comparison / contrast Recognize the correct use of punctuation and capitalization
	Level 16	Use sentences to talk about familiar topics: home, family, school, friends, food, drinks and daily activities
Course 7	Level 17	Express likes, intentions, possession, ability, completion and the future Use daily greetings and courtesy words
	Level 18	Practice expressions to ask for help, persuade and reject politely Practice verbal directions, observations and expressions of feelings

	Level 19	Use sentences and expressions to talk about the environment
Course 8	Level 20	Refresh knowledge of the alphabet, word reading and vocabulary Strengthen listening and reading comprehension skills Recognize cursive form of alphabet letters
	Level 21	Refresh knowledge of sentence construction and daily expressions Strengthen listening and reading comprehension skills Recognize cursive font put as words

Sekolah Enuma: Math Learning Objectives

The Math curriculum covers early childhood learning through 2nd grade content and aligns with the core competencies of the country's National Math Curriculum.

Course	Level	Learning Objective
Course 1	Level 1	Understand numbers and quantities up to 5 Match everyday objects to two-dimensional shapes
	Level 2	Understand numbers and quantities up to 10 Name basic two-dimensional shapes (i.e., circle, triangle, square, and rectangle)
	Level 3	Recite numbers up to 20 Understand the sequence of numbers from 1 to 5 Recognize and complete AB repeating patterns
Course 2	Level 4	Understand numbers and quantities up to 20 Sort by color Match everyday objects to three-dimensional shapes Compare the quantities of two numbers within 10
	Level 5	Understand the sequence of numbers from 1 to 10 Compose and decompose numbers within 5 Understand the concepts of addition and subtraction and express them in number sentences
Course 3	Level 6	Add and subtract within 5 by using objects Read time to the hour Compose and decompose numbers within 9
	Level 7	Compare the quantities of two numbers within 20 Add and subtract within 10 by using objects Understand the sequence of numbers from 1 to 20
	Level 8	Represent numbers from 11 to 19 in one group of 10 and individual ones Fluently add and subtract numbers within 5 Identify and complete ABC patterns
Course 4	Level 9	Count objects up to 100 when shown in groups of 10 Understand the number bonds to 10 Find a 1 more or 1 less number within 100
	Level 10	Fluently add and subtract numbers within 10

		Name basic three-dimensional shapes (i.e., sphere, cube, cylinder, and cone) Find the unknown number in addition when the sum is 10
Course 5	Level 11	Represent two-digit numbers in groups of 10 and individual ones Add and subtract numbers within 20 by using objects Understand place value of each digit in a two-digit number
	Level 12	Compare two two-digit numbers using equality/inequality notations ($>$,$=$,$<$) Skip count by 10s within 100 Add and subtract multiples of 10 in the range of 100
	Level 13	Solve addition and subtraction word problems within 10 Add a two-digit number and a one-digit number Subtract a one-digit number from a two-digit number
Course 6	Level 14	Skip count by 2s within 100 Add and subtract two-digit numbers without regrouping Read time to the half-hour
	Level 15	Skip count by 5s within 100 Add and subtract within 20 with regrouping Understand the sequence of numbers within 100
	Level 16	Fluently add and subtract within 20 Solve addition and subtraction word problems within 20
Course 7	Level 17	Count objects up to 1000 when shown in groups of 10 and 100 Recognize shapes by attributes, such as sides or vertices Add a number (11 and 19) and a one-digit number with regrouping
	Level 18	Skip count by 100s within 1000 Add a two-digit number and a one-digit number with regrouping Understand multiplication as repeated addition Subtract a one-digit number from a two-digit number with regrouping
Course 8	Level 19	Represent three-digit numbers in groups of hundreds, tens, and individual ones Read time to the 5 minutes Understand place value of each digit in a three-digit number Compare two three-digit numbers using equality/inequality notations
	Level 20	Multiply by 2, 3, 4 ,5 Order three-digit numbers based on the magnitudes Find a 100 more or 100 less number within 1000
	Level 21	Multiply by 6, 7, 8, 9 Add two-digit numbers with regrouping Subtract two-digit numbers with regrouping

Sekolah Enuma: English as a Foreign Language Learning Objectives
The English as a Foreign Language curriculum draws on global best practices for English language education and takes into consideration the cultural context of each implementation country.
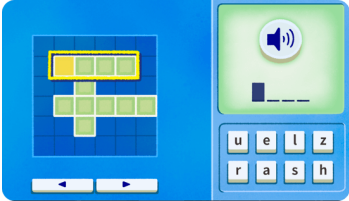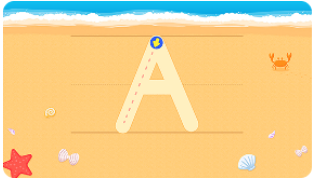
Course	Level	Learning Objective
Course 1	Level 1	Learning the alphabet Letters A - P and vocabulary
	Level 2	Learning more of the alphabet Letters Q - Z and vocabulary
Course 2	Level 3	Learning phonics (individual sounds) New vocabulary: feelings, day and night, transportation
	Level 4	Learning phonics (2) individual sounds New vocabulary: actions, people, colors, vegetables
Course 3	Level 5	Learning more phonics / sounds New vocabulary: opposites, colors, animals, toys
	Level 6	Learning more phonics / sounds New vocabulary: body, family, school, clothes
Course 4	Level 7	Phonics: blended sounds Verb to be Subject pronouns New vocabulary: home, weather, drinks
	Level 8	Phonics: blended sounds Action verbs New vocabulary: sweets, sizes, face, jobs
Course 5	Level 9	Phonics Simple Sentences New vocabulary: sports, bathtime, birthday, days of the week
	Level 10	Phonics Negatives Questions New vocabulary: senses, town, taste
Course 6	Level 11	Phonics Sentence structure Possessive New vocabulary: bedroom, playground, garden, daytime routines
	Level 12	Phonics: new sounds Sentence practice New vocabulary: nature, insects, morning routines
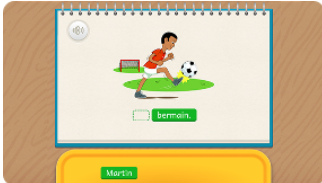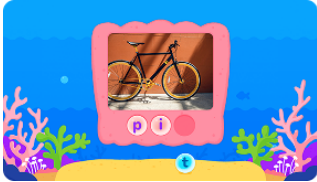
Course 7	Level 13	Sentences Negatives Questions New vocabulary: kitchen, action words, sports
	Level 14	Building language: conjunctions, making requests, this / that / these / those New vocabulary: music, clothes
Course 8	Level 15	Learning to describe things Answering questions New vocabulary: funny verbs, adjectives
	Level 16	Asking questions New vocabulary: fruits, vegetables, animals
Course 9	Level 17	Verbs Direct object pronouns New vocabulary: verbs, cooking, transportation
	Level 18	*Continuation from previous level*
Course 10	Level 19	Time and Day Questions, Giving Directions, at/in/on New Vocabulary: days of the week, months, seasons, countries, and places
	Level 20	*Continuation from previous level*
Course 11	Level 21	Asking and Answering about the Location of Things, Describing Locations and Places, Possessives, "How often...?" New Vocabulary: continents, nature, after school activities
	Level 22	*Continuation from previous level*
Course 12	Level 23	Quantities, Asking and Answering "How Many...?" and "How Much...?" Singular and Plural New Vocabulary: materials and condiments
	Level 24	*Continuation from previous level*

Appendix 2: Sekolah Enuma Games, Books and Videos
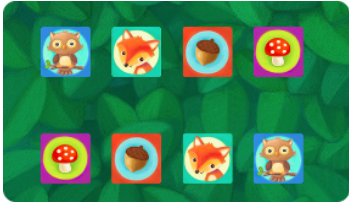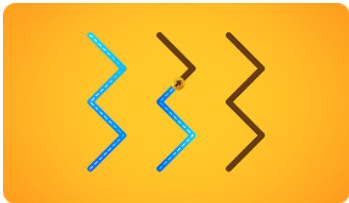
Indonesian Literacy Games
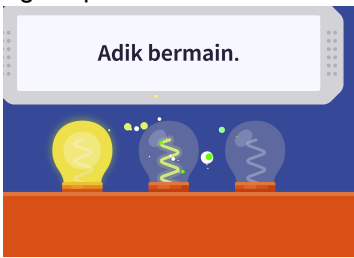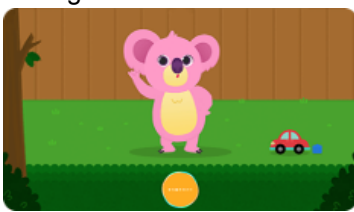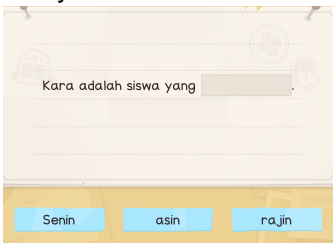
No.	Game Title	Description	Learning Goal
1	Alphabet Puzzle	Drag the block into the right position. When the user touches the block, the letter name is spoken.	Letter identification Letter names
2	Assembling Pictures	Drag the puzzle pieces together to make an object and practice saying its name.	Object recognition Visual/spatial processing Vocabulary
3	Bird Phonics	When the game starts, each bird says its phonics sound. The user chooses the bread with the right phonics for the right bird. When the user touches the bread and bird, the sounds are spoken.	Phonics Vocabulary
4	Crosswords	Play the crosswords and enhance vocabulary skills.	Letter identification Word recognition Vocabulary Phonics
5	Explain to Me	Help the Cat Detective to find the right word.	Enhance syntax Question comprehension

6	Animal Puzzle	Drag the animal puzzle pieces to their correct position and hear the word.	Visual/ spatial Digital literacy Vocabulary
7	Labeling	Drag the right label from the word list to the matching object. When the user touches the label, the word is spoken.	Vocabulary Word identification
8	Letter Matching	Match the correct letters together.	Letter identification Familiar word reading
9	Letter Tracing	Trace letters.	Letter identification Letter naming Writing
10	Trace 3 Times	Trace a letter 3 times and learn words that begin with that letter.	Letter identification Letter naming Letter sounds Writing Vocabulary
11	Comprehension	Listen to the story or read the text and select the right answer for the question.	Listening and reading comprehension

12	Missing Words	Complete the sentences with the correct words to match the pictures.	Vocabulary Reading comprehension
13	Sentence Bridge	Complete the sentence by using the letter cards. When the sentence is complete, the car moves across the bridge.	Writing Letter recognition Phonics Vocabulary Punctuation Sentence structure
14	Sentence Maker	Create a sentence according to the sound and the image.	Writing Sentence completion Vocabulary
15	Sound Train	Listen and see a letter or a word. Drag letters or syllables to the correct space to match.	Phonics Letter sounds Decoding Spelling
16	Spelling	Choose the correct alphabet bubbles to make words that match the object. When the user touches the letter bubbles, the letter sound is spoken. When the word is complete, the word is spoken.	Vocabulary Spelling Decoding Phonics
17	Typing	Practice typing letters for letters, syllables and words.	Typing Word recognition Spelling Letter identification Vocabulary
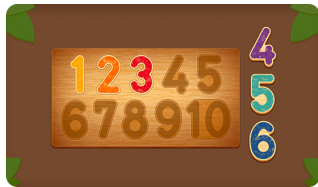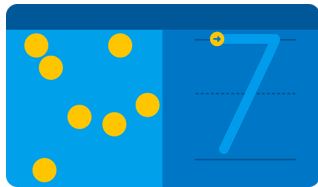
18	What is This?	Pick a phrase or sentence that best describes the pictures.	Vocabulary Object recognition Comprehension
19	Word Kicker	Drag the correct word into place to create a complete sentence.	Vocabulary Grammar Decoding Word recognition
20	Word Machine	Watch letters rotate into the correct position, sounding out each letter sound before hearing the full word. Select the correct image to accompany the word.	Phonics Decoding Vocabulary
21	Word Matrix	Mix and match to create new words.	Phonics Vocabulary
22	Word Note	Spell the words with letter cut-outs and listen to the word pronunciation.	Letter identification Phonics Word recognition
23	Word Tracing	Practice tracing the high-frequency words.	Letter identification Writing Word recognition
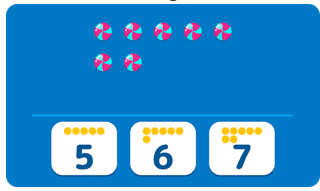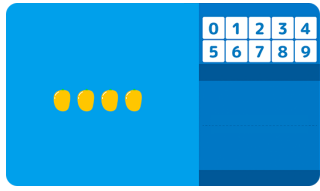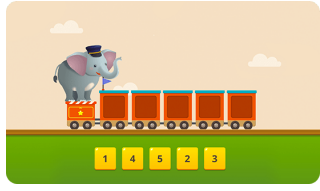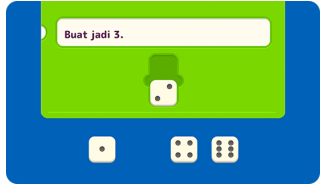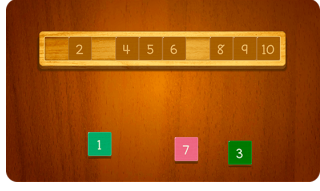
24	Match Game	Match the picture cards together by tapping on them.	Digital literacy Matching
25	Tutorial Trace	Trace the lines with the guidepoint.	Fine motor skill Pre-writing
26	Bubble Pop	Tap the bubbles.	Digital literacy
27	Speech Bubbles	Help complete the conversation!	Comprehension Speaking Vocabulary
28	Jelly Affix	Play with the jelly to see how it changes the word.	Word structure Phonics Syntax
29	Missing Letter	Name the blank egg according to its correct alphabetical order.	Letter identification Letter ordering
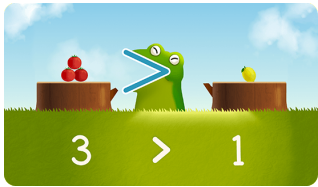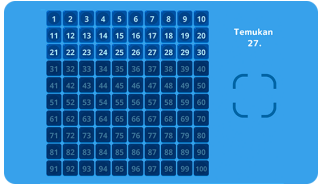
30	Phonics Station	Load passengers or boxes with the right sound.	Phonics Letter identification
31	Light Up!	Practice reading aloud to turn on the bulbs.	Decoding Pronunciation Phonics
32	Jewel Miner	Help Mr. Mole to mine the matching jewels.	Letter identification
33	Talking Koala	Learn with the koala to pronounce the words.	Speaking Listening Pronunciation
34	Sticky Sentences	These are unfinished notes. Help choose the correct words or phrases to complete them.	Syntax Vocabulary Decoding Comprehension
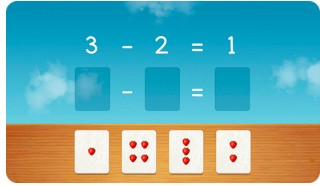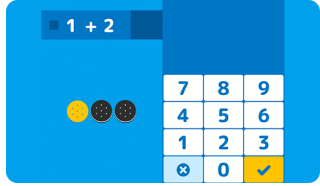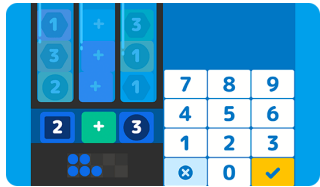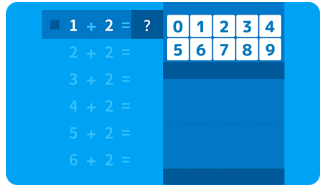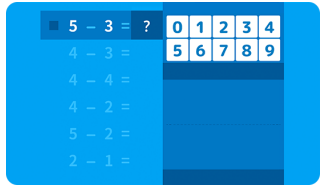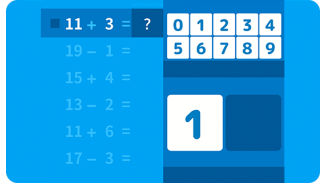
35	Listen Swap	Swap the letters to spell the word correctly!	Vocabulary and spelling
36	Alphabet Card Puzzle	Let's put the pieces together and see what letter it is!	Letter identification Visual/ spatial Vocabulary
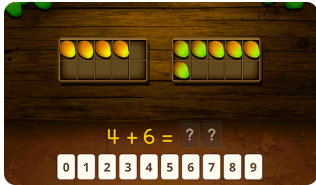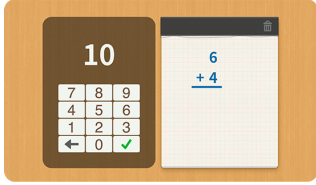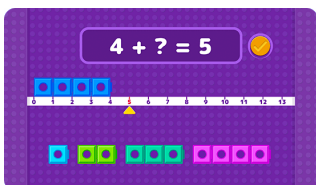
Math Games
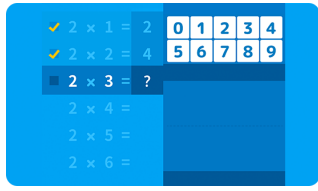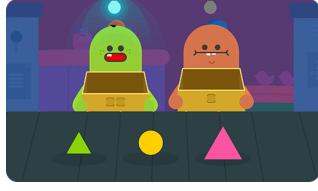
No.	Game Title	Description	Learning Goal
1	Number Blocks	Learn and practice numbers to 20. Put the puzzle pieces in order.	Number awareness Quantity awareness Subitization
2	Learn to 20	Practice writing and counting numbers to 20.	Number writing up to 20
3	Number Tracing	Practice writing and counting numbers to 110.	Number writing up to 110
4	Number Matching	Match the same shapes or numbers.	Number awareness Quantity awareness
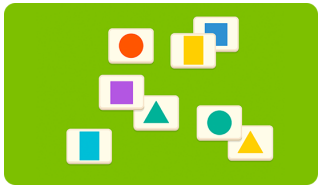
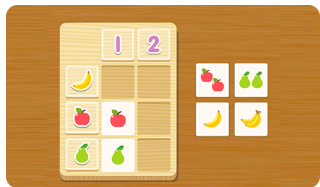|			
5	Basic Counting	Practice counting skills and focus on numbers 1 to 20 in this multiple-choice game.	Number and quantity awareness Subitization
6	Counting	Count fruits and vegetables by ones, twos, threes, fives, tens, and hundreds.	Skip counting by 1,2,3,5,10, 100s.
7	Number Train	Help the mouse and elephant order the numbers on the circus train.	Ascending/descending order of numbers up to three-digits
8	Domino Math	Count and make number combinations with dominos in this early adding game.	Number sense Addition
9	30 Puzzle	Put the puzzle pieces back together to complete the order of numbers to 30.	Ordering numbers up to 30
10	Place Value	Use concepts of place value to fill the water tank.	Understanding the place value of a number up to three-digits

11	Missing Number	Identify the pattern in a number sequence and practice skip counting.	Skip counting up to 1,000
12	Feeding Time	Explore the concept of comparing numbers (greater than, less than, equal to) and quantities as you feed the hungry monster.	Magnitude comparison of two numbers up to three-digit numbers
13	100 Board	Use clues to find the correct number on the hundred's board.	Identifying and ordering numbers up to 100
14	Bubble Pop	Pop the bubbles and count up to 100.	Counting up to 100 Digital competence
15	Fish Tank	Compose and decompose numbers while returning the fish to their correct tanks.	Composition/decomposition of a number Operational strategies
16	Equation Maker	Become a master at creating number sentences for addition, subtraction, and multiplication.	Equation sentences with three whole numbers Operational strategies

	3 – 2 = 1		
17	Cookies	Two hungry cats swap cookies in this addition and subtraction game.	Addition and subtraction concepts
18	Falling Blocks	Use the ten-frame to add and subtract numbers from 0 to 20.	Addition and subtraction up to 20
19	Quick Adding	Practice addition during this speedy math workout.	Addition concepts
20	Quick Subtraction	Practice subtraction in this speedy math game.	Subtraction concepts
21	Quick Facts	Build addition and subtraction fluency in this fast-paced game.	Addition and subtraction up to 20
22	Jewel Math	Use your quick math skills to collect the jewels.	Addition and subtraction

23	Mango Shop	Learn adding and subtracting with regrouping by moving fruits in and out of the box.	Addition and subtraction with regrouping
24	Math Kicker	Solve addition and subtraction problems to score a goal.	Addition and subtraction concepts
25	Multi-Digit Math	Use scratch paper to help solve challenging 2 and 3 digit equations.	Addition and subtraction with regrouping
26	Light It Up	Arrange the building blocks on the number line to match the equation and reveal the answer.	Addition and subtraction with manipulatives
27	Word to Equation	Use the clues in the word problems to build addition and subtraction number sentences.	Addition and subtraction
28	Word Window	Visit the pet store and sweet shop and use your math skills to solve these word problems.	Word problems
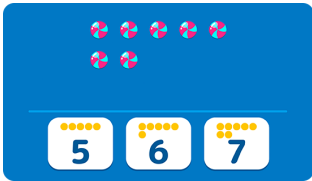
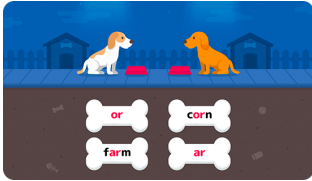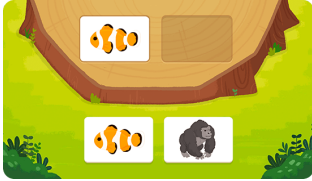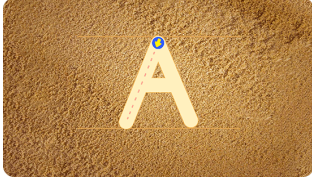|			
29	Multiplication Lamp	Use your multiplication skills to help light up the lamps and brighten the windows.	Understanding the concept of multiplication
30	Quick Multiplication	Master multiplication facts with this fast-paced game.	Multiplication facts
31	Froggy Hop	Practice multiplication facts with the jumping frog.	Multiplication facts
32	Shape Tracing	Draw and name 10 common shapes.	Shape recognition and formation
33	Shapes Factory	Practice shapes by helping the toy factory monsters pack the shapes in their boxes.	Shape recognition
34	Shapes Matching	Identify 2D and 3D shapes by name, orientation, and relationship to everyday objects in this fun matching game.	Shape recognition Shape naming Shape matching

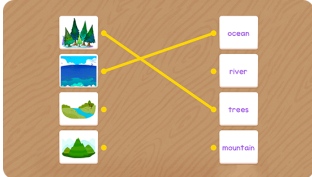|			
35	Falling Shapes	Practice shapes by identifying them by their attributes.	Shape recognition
36	Match it Up	Draw lines to match shapes and objects to one another.	Shape recognition with real object Pattern recognition Number and quantity awareness
37	Train Time	What time does the train leave? Match the numbers to the clock to watch the train take off.	Analog and digital time
38	Ferris Wheel	Practice counting by 1s and 5s to put the ferris wheel cars in the correct order.	Counting by ones and fives.
39	Find the Match	Practice identifying shapes that are the exact match.	Shape recognition Shape naming
40	Pattern Train	Play and identify all the different patterns (objects, colors, sizes, and numbers).	Pattern recognition
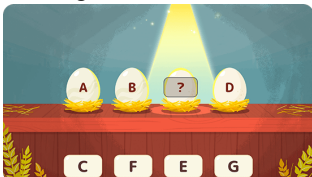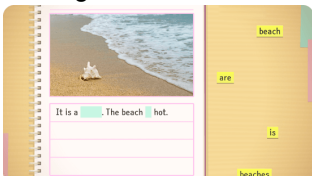
41	Puzzle Matrix	Practice problem solving by identifying where the colorful missing pieces belong.	Number recognition Quantity recognition
42	100 Puzzle	Put the puzzle pieces back together to make 100. Each level contains a new challenge.	Number sequence up to 100
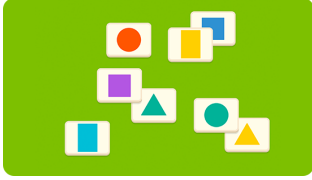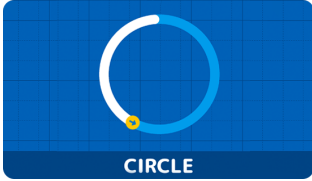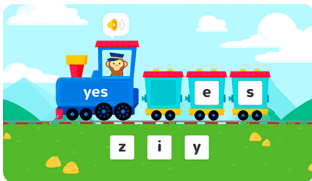
English Games
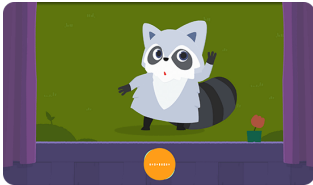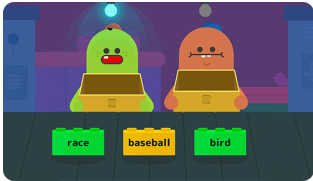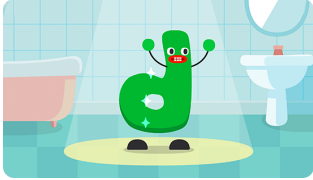
No.	Game Title	Description	Learning Goal
1	Alphabet Puzzle	Practice arranging alphabet blocks in order.	Letter identification Letter names
2	Picture Puzzle	Put the puzzle pieces together and discover what animal it is.	Object recognition Visual/spatial processing Vocabulary
3	Basic Counting	Practice counting skills and focus on numbers 1 to 20 in this multiple-choice	Numbers Quantity awareness
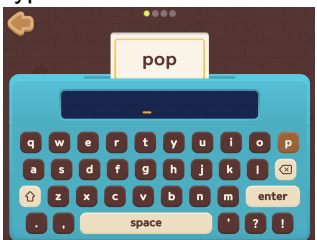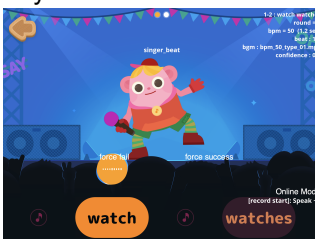
		game.	Subitization
4	Break and Build	Build the sentence and help the penguin get the fish.	Syntax Vocabulary
5	Coloring Monster	Help the Monster find what he is looking for.	Vocabulary
6	Cookie Box	Pick the right cookie to make the sentence, then put it in the box.	Syntax Vocabulary
7	Days and Weeks	Practice learning about days, weeks, and months.	Vocabulary
8	Dog Phonics	Feed the two dogs some yummy English treats and practice English sounds and words.	Phonics
9	Find The Pair	Find the matching pairs.	Vocabulary

10	Flash Card	Play the card game with your pet and match the word to the correct object.	Vocabulary
11	I Spy	Match the word with the correct object.	Vocabulary
12	Jewel Miner	Become a mining mole and dig out letter jewels.	Letter identification
13	Labeling	Label the pictures and don't forget to give them a title.	Vocabulary
14	Literacy Matching	Match the cards with pictures and letters together.	Vocabulary
15	Letter Writing	Practice writing letters on the ground and learn new words that begin with that letter.	Writing Letter identification Vocabulary
16	Letter Tracing Card	Trace a letter 3 times and learn the words.	Letter identification Phonics Vocabulary

17	Line Matching 	Connect the matching pairs with lines.	Vocabulary
18	Star Search 	Which stars are we looking for? Search for the right stars!	Phonics Letter identification Decoding
19	Memory Match 	Practice exercising your memory. Can you remember where the pair is?	Vocabulary Matching Spatial recognition
20	Missing Letter 	Spot the missing letter and put it back in its place.	Letter identification Letter ordering
21	Missing Words 	Put the correct words in the sentences to match the picture.	Syntax Vocabulary Decoding
22	Number Puzzle 	Learn and practice numbers to 20. Put the puzzle pieces in order.	Number identification

23	Number Tracing	Practice writing, matching, and counting numbers to 20.	Writing Number identification
24	Paint the Word	Observe the drawing, can you say the word?	Vocabulary Speaking Pronunciation
25	Pattern Train	Practice playing all the different patterns (objects, colors, sizes, and numbers).	Pattern recognition Shapes
26	Pet Dictation	Practice saying the word and the fox will help to write them.	Speaking
27	Sentence Bricks	Choose all the correct words to complete the sentence.	Syntax Vocabulary
28	Fill in the Blank	What is missing in a sentence? Fill it in with the correct words.	Grammar Vocabulary Syntax
29	Shapes Matching	Identify 2D and 3D shapes by name, attribute, orientation and relationship to everyday objects in this fun matching game.	Vocabulary Shapes Matching

30	Shape Tracing	Draw and name 10 common shapes.	Vocabulary Shapes
31	Silly Hat	Who is saying a different word? Let's put a silly hat on!	Word recognition Phonemic awareness
32	Sorting Rockets	Help the alien's rocket take off by adding the correct words to the group.	Vocabulary Word recognition
33	Sound Train	Help Captain Monkey drive the English Train with the correct sounds.	Phonics Alphabet knowledge
34	Spell Balls	Slide the tray and catch the fruit to spell the word.	Letter knowledge Phonics
35	Clouds	Practice typing the words in the clouds to see the shining stars.	Typing Letter knowledge

36	Sticky Sentences	These are unfinished notes. Help choose the correct words or phrases to complete them.	Syntax Vocabulary Decoding Reading comprehension
37	Space Repair Shop	The space ship has broken down! Help repair it by choosing the right tools and parts!	Vocabulary Listening Reading
38	Talking Racoon	What does Racoon want? Let's talk with the Talking Racoon.	Speaking Listening Pronunciation
39	Toy Factory	Help the toy factory monsters pack the right items in their boxes.	Phonemic awareness Word recognition Phonics
40	Train Time	What time does the train leave? Match the numbers to the clock to watch the train take off.	Analogue and digital time
41	Bath Time	Wash the alphabet and listen to the sound they make.	Letter knowledge Phonemic awareness
42	What Is This?	Choose the words or sentence that best describes the picture.	Vocabulary Decoding

			Syntax
			Syntax
43	Word Grocery	Help the animals with their grocery shopping by choosing the right items they need.	Vocabulary Listening Decoding Syntax
44	Word Kicker	Listen and then choose the correct word or phrase to complete the sentence and kick a goal!	Syntax Decoding Phonics Listening
45	Word Machine	Press the button, and it will generate a word! What does it mean?	Vocabulary Phonics
46	Word Tracing	Practice tracing the words, and then you'll see something wonderful!	Writing Vocabulary
47	Sentence Bridge	Complete the sentence by using the letter cards. When the sentence is complete, the car moves across the bridge.	Writing Letter recognition Phonics Vocabulary
48	Spelling	Use the picture cards to help choose the right letters to spell the words.	Spelling Vocabulary

49	Type Time	Type the words or phrases to complete the activity.	Reading Spelling
50	Alien Chat	Have a conversation with your Alien friend! Practice common conversational phrases and dialogue.	Speaking Listening Reading Listening
51	Rhythm Time	Practice speaking with your pop singer friend in time with the rhythm!	Speaking Listening Reading Listening

Learning Videos
Indonesian Videos The Sekolah Enuma library contains over **300 Indonesian videos** covering a wide range of topics including: Alphabet and Letter Names (30+) Story Reading (5+) Natural Disasters (5+) Indonesian Folktales (100+) Music and Songs (35+)

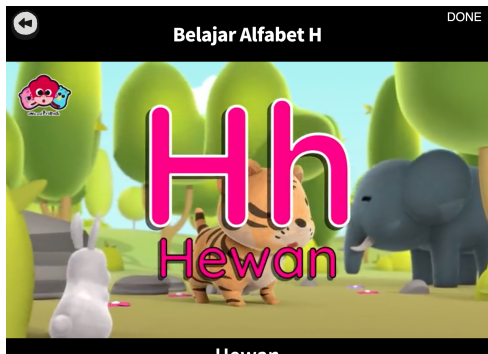Indonesian Stories (40+)
Learning Videos (60+)

Image: Letter "H" Alphabet Book Video

Image: Syllables Learning video

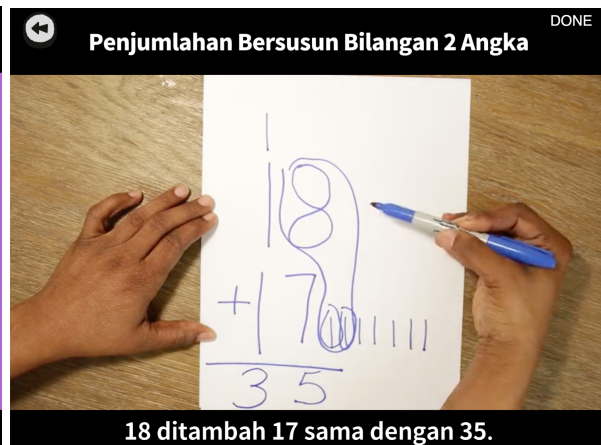Image: Reading Position and Read Aloud video

Math Videos

Sekolah Enuma contains over **80 Math Videos** available to support math learning objectives including:

Numbers
Operations
Shapes
Measurement

Image: Recognize Numbers 4 and 5 Video
Video

Image: Adding 2-digit numbers with regrouping

DONE
Mengenali Angka 4 dan 5
4
5
Sekarang kita bisa menggunakan angka-angka

DONE
Penjumlahan Bersusun Bilangan 2 Angka
18 ditambah 17 sama dengan 35.

English Videos:

The Enuma School library contains over **300 English videos** covering a wide range of topics to support English language and reading skills including:

Conversation
Music
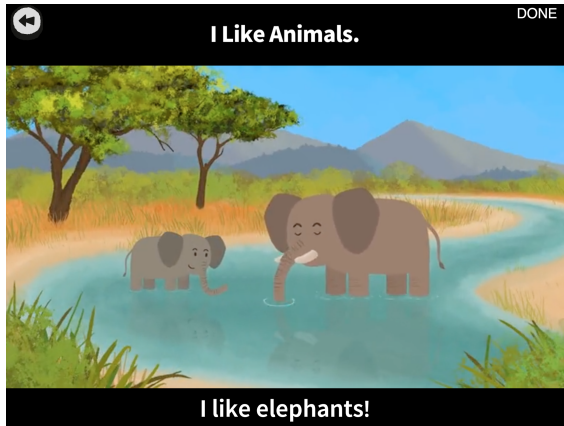Animation
Grammar
Live Action Stories

Image: 'I Like Animals!' Video

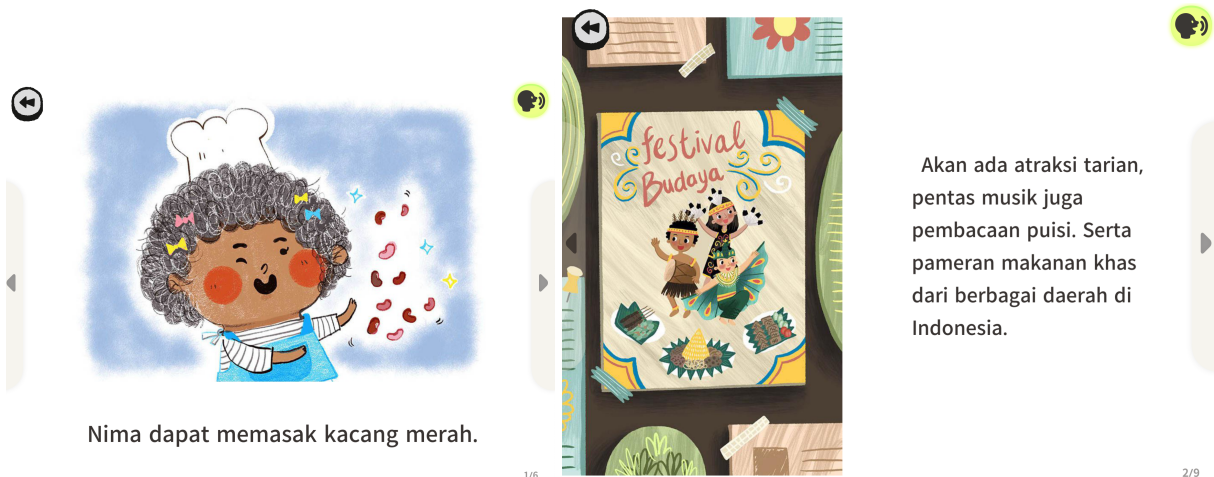Image: 'And, Or, But' Grammar Video

Books

Indonesian Books

The Sekolah Enuma library contains over **210 Indonesian books** with engaging illustrations and including:

Alphabet Books
Storybooks

Indonesian Storybook Topics include: Animals, Counting, Feelings, Nature, Greetings, Colors, Daily Activities, Tolerance, Directionality, Comparison, Friends and Family, Transportation, Foods, Imagination, Healthy Habits, Hobbies, Natural Disasters, Marine Life, Farming.
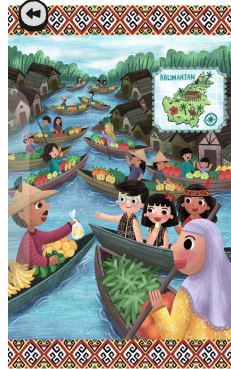

Nima dapat memasak kacang merah.

1/6

Akan ada atraksi tarian, pentas musik juga pembacaan puisi. Serta pameran makanan khas dari berbagai daerah di Indonesia.

2/9

Book: *Cooking Beans with Neema*, By Lucy Geay; Book: *Cultural Festival at School, By Dayu Rifanto*

Bahasa Indonesia bahasa kita.

6/7

Kalimantan terkenal akan sungai-sungainya yang panjang. Ada Sungai Kapuas, Sungai Mahakam, Sungai Barito dan lainnya.

"Wah, banyak orang naik perahu berbelanja di Pasar Apung," kata Nelce.

"Aku tahu! Itu pasar di Sungai Barito, Kalimantan Selatan," ujar Stanley.

5/10

Book: *Our Language*, By Suri Meidianshari; Book: The beauty of my country, By Dayu Rifanto

English Books

Sekolah Enumal contains over **290 English books** with engaging illustrations covering a diverse range of topics, and that support our English learning objectives.

English Storybook topics include: Family, Animals, Pets, Senses, Shapes, Animals, Numbers, Transportation, Sports, Family, Friends, Greetings, Body Parts, Foods, Instruments, Days of the Week, Nature, Jobs, Care for the Earth, Weather.

I am a scientist.

6/10
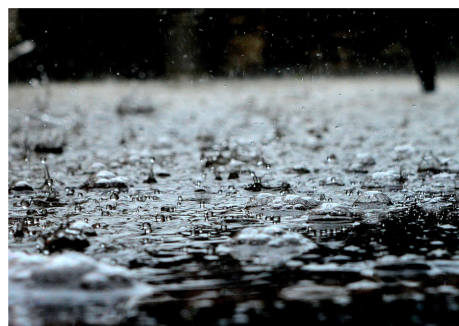
Book: *I Can Be Anything*, by Rachael Tobener

It is rainy.

3/7

Book: *How is the Weather?*, by Minnie Mills

Appendix 3: Other Enuma Products

Sekolah Enuma is based on the design methods shared across Enuma's products. We have created and evolved these design methods over time, and they have been proven successful globally around the world with different populations through our previous products. We have created Sekolah Enuma from the lessons learned and wisdom gained from our award-winning, best-selling products: Kitkit School, Todo Math, and Todo English.


Kitkit School, Global Learning XPRIZE Winner (2019)

Enuma's Kitkit School was a winner of the prestigious US $15 million Global Learning XPRIZE sponsored by Elon Musk. The Global Learning XPRIZE challenged teams from around the world to develop open-source, scalable software that empowers children to teach themselves foundational reading, writing, and arithmetic in low-resource contexts. The software was required to run on any tablet device without internet connectivity or teacher presence. Kitkit School achieved the highest learning outcomes and engagement among the five finalist teams during the 15-month field test in Tanzania. In our test, children who were not able to learn at home or attend school achieved exciting learning gains. Kitkit also demonstrated that there is a great opportunity for children to learn basic reading, writing, and math through well-designed software.
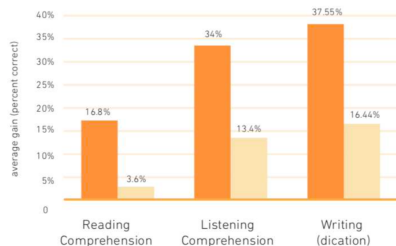
the average gains of the treatment group are **2 to 4 times greater** than ones of the control in EGRA non-timed subtasks.
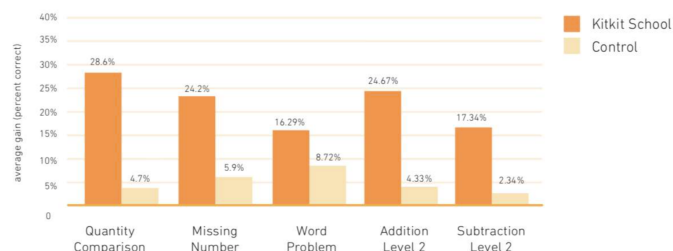
the average gains of the treatment group are **1.8 to 7 times greater** than ones of the control in EGMA non-timed subtasks.

***Todo Math: Most Popular Mathematics app in the Apple App Store***

Todo Math is the most popular Mathematics app in the Apple App Store with over 9 million downloads. Launched in 2014, Todo Math is an engaging and accessible math app for children in Pre-K through 2nd grade. From counting to fractions, Todo Math's Common Core-aligned curriculum covers all of the foundational math skills kids learn in school. Featuring 700+ fun math activities, Todo Math provides hours of practice that helps children build confidence and excel in school and out.

Todo Math is currently used in 3000+ classrooms across the United States for PreK to 2nd grade Math (3 to 7 years old). The application can run on any smartphone or tablet device (both Apple and Android). Once the app is downloaded, no internet access or additional data is required. Todo Math currently supports eight languages: English, Korean, Mandarin, Japanese, French, German, Spanish, and Portuguese. A dashboard is available for parents or teachers to monitor a child's progress.
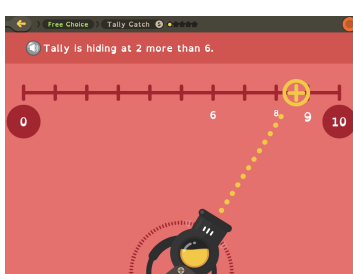
Todo English: Best-Selling English as a Foreign Language App Since Release in 2020 in Korea
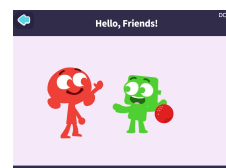
Todo English is a comprehensive English as a Foreign Language (EFL) Program which covers curriculum from Pre-K to 2nd grade in an English medium school. It is the best-selling EFL app for children in Korea after launching in 2020. Todo English empowers students to learn a strong foundation of English, including speaking, reading, writing, and listening. It also teaches

American English-speaking manners and culture. Todo English currently supports three instructional languages; Korean, Mandarin, and Japanese.

Todo English includes more than 2,000 game-based EFL activities and two years of daily courses. It contains a library with more than 300 original lecture, live-action, and animation videos featuring US children's daily life and culture. The library also includes more than 200 original books that support the core English curriculum, model conversation, and engage the children in delightful stories. Our book and video library includes characters and stories that emphasize Enuma's core values of positive social-emotional development, diversity, and global citizenship.