KEEP MOVING FORWARD: GROWTH AND DEVELOPMENT THROUGH SCIENCE USING PICTURE BOOKS



Lisa and Mardhiah
Librarians
National Library Board











Lisa Zuliana Binte Zulkifli Marchiah Binte Mahamood Librarian



Happy to meet you!!

What Will be Covered

- What is STEAM?
- Bloom's Taxonomy & Sensory Exploration + Recorded Demonstration
- Popular Picture Books to Introduce STEAM Concepts
- Enhance Learning through Non-Fiction Books
- · Keep Trying! Growth Mindset and the Importance of Failure



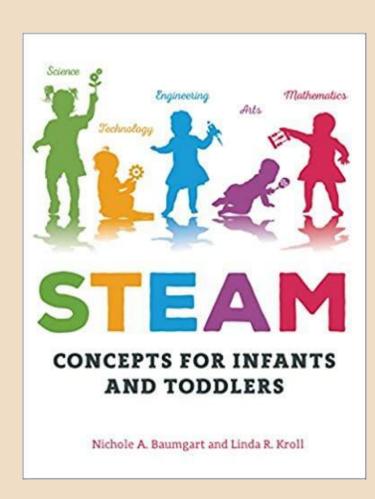
What is stanta

- S Science
- T Technology
- E Engineering
- A Art
- M Mathematics





What is steam?



STEAM Concepts for Infants and Toddlers

By Nichole A. Baumgart & Linda Ruth Kroll Available in NLB Overdrive

https://nlb.overdrive.com/media/3684719



STEAM concepts encourage children "to find and explore interesting and important questions".

(Baumgart & Kroll, 2018, p. 25)

Frame "a given learning experience and provoke(s)...thinking...a process for understanding that goes beyond knowing a defined set of facts."

(Baumgart & Kroll, 2018, p. 29)



Why is steam in portant?

"Develops robust thinking dispositions...as well as a strong learning mindset and confidence"

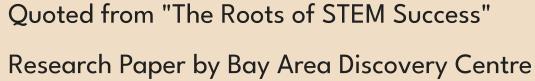
"Boosts literacy development by providing [opportunities] for children to expand vocabulary"

"Understand[ing] direct causal relationships...and more complicated causal relationships.."

"Using statistical inference is present very early in development..."

"...Evoke(s) curiosity, motivate(s) them to explore, lead(s) them to engage in hypothesis testing..."

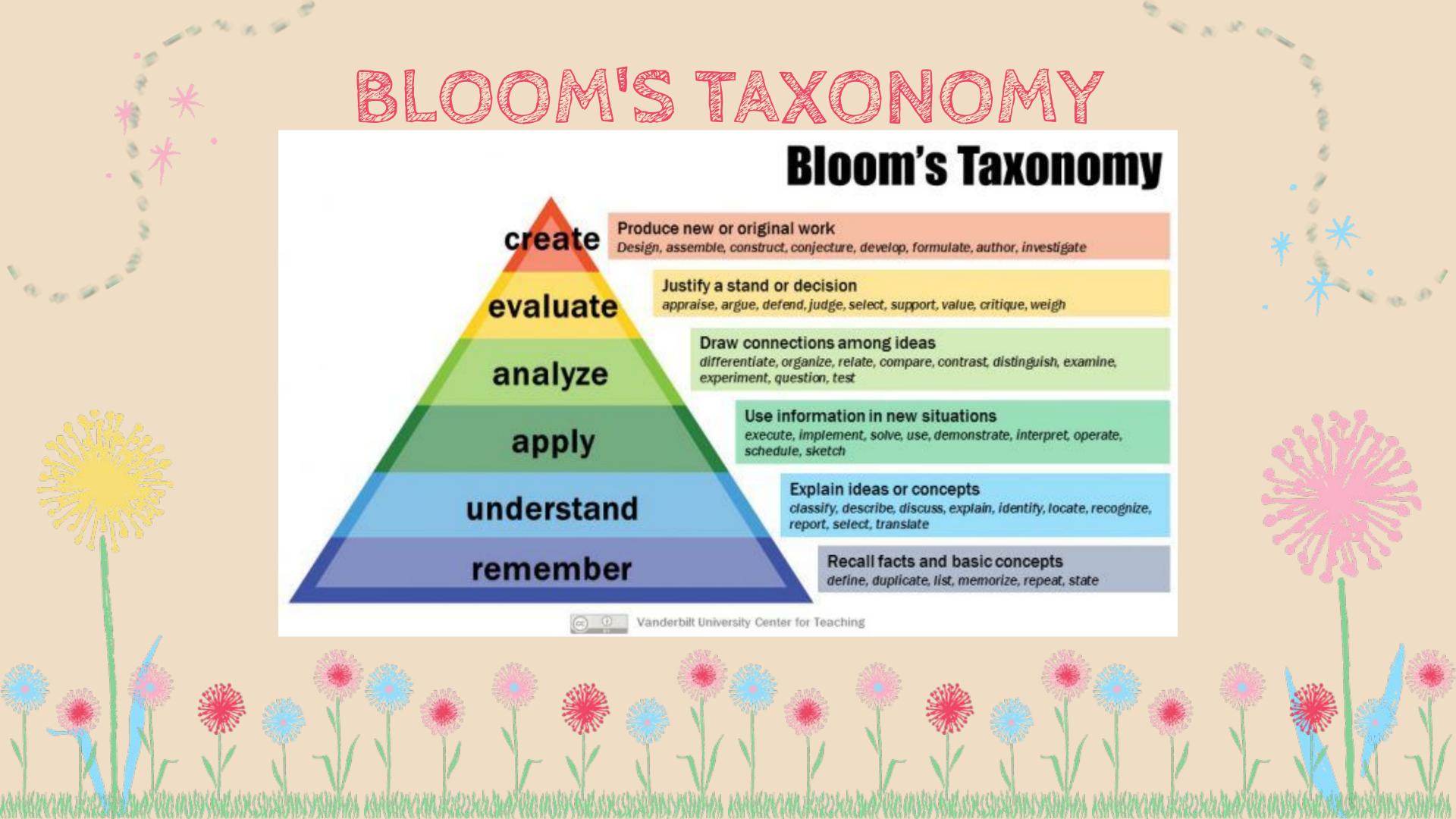
"...lead to greater problem-solving skills and better equip [them] for the dynamic world..."











QUESTIONS TO APPLY DURING

These are based on Bloom's Taxonomy and NAEYC's Big Questions for Young Minds by Janis Straser and Lisa Bresson.

- Remember Identify, Name, Count, Repeat, Recall
- Understand Describe, Discuss, Explain, Summarise
- Apply Explain why, dramatise, identify with/relate to
- Analyse Recognise change, Experiment, Infer, Compare, Contrast
- Evaluate Express opinion, Judge, Defend/Criticise
- Create Make, Design, Construct, Author

Ask questions related to



ng processes to your child when reading together!



DEMONSTRATION





STEAM Programme on Weather

Done by our fellow librarian, Norah



Popular Picture Books to Introduce STEAM Concepts





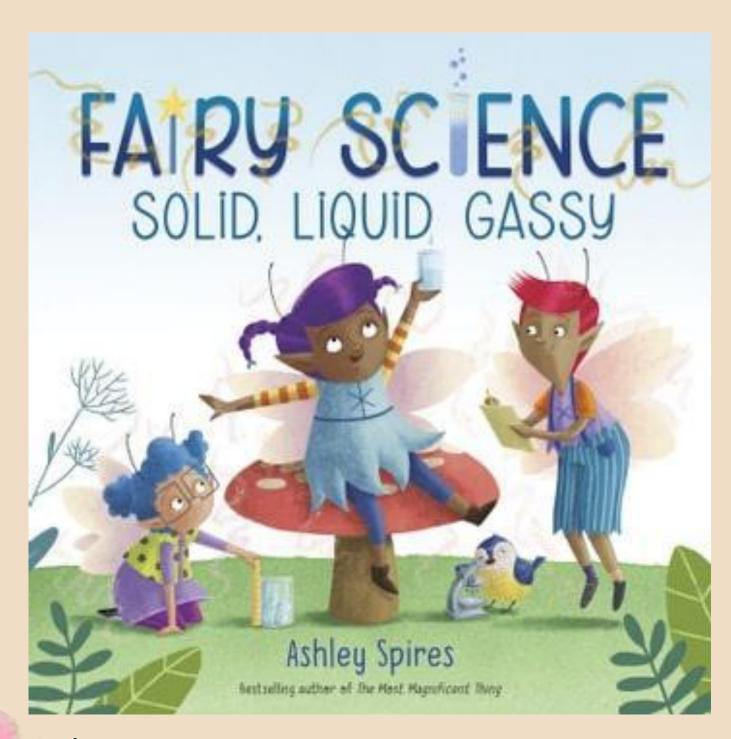
- Applied Chemistry
- Applied Mathematics
- Applied Physics Engineering
- Biotechnology Bacteria and Viruses
- Food Sciences







Appled Chemisty



By: Ashley Spires

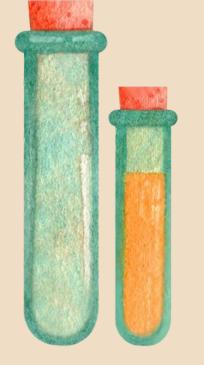
Publisher: New York: Crown Books for Young Readers,

[2020]

Section: Early Literacy Picture Books

Call Number: English SPI









Appled Chemistry

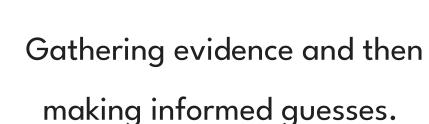


Fairy Science: Solid, Liquid, Gassy promotes the fundamentals of Science!

Children can learn about the water cycle in this enchanting

STEM-and-magic-filled book.

Watch how the fairies ask questions and investigate certain factors; they always ask "why".



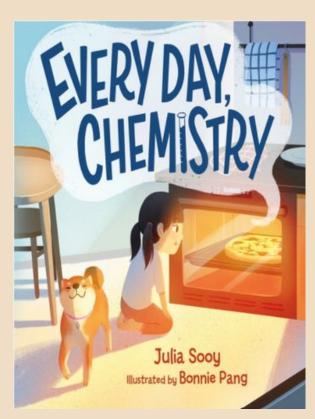
Show your child how things that appear "magical" are the result of Science!

Observation and inquiry are important STEAM skills.

Analyse and deduce the evidence gathered

Children learn best with fun! Rainbow, slime and lava are magical parts of Science.

More... on Applied Chemistry



Every Day, Chemistry

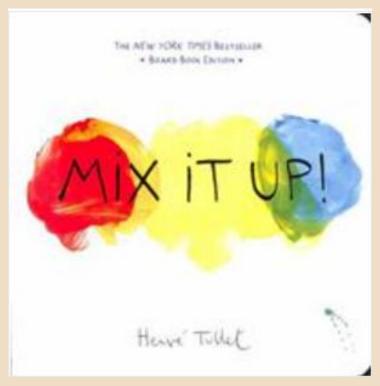
By: Julia Sooy & Bonnie Pang

Overdrive:

https://nlb.overdrive.com/medi

a/6301243





Mix it Up!

By: Hervé Tullet

Publisher: San Francisco, CA:

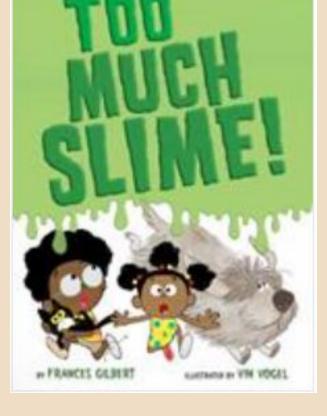
Handprint, an imprint of

Chronicle Books LLC, 2021

Section: Early Literacy

Concepts

Call Number: 535.6 TUL



Too Much Slime!

By: Frances Gilbert & Vin

Vogel (Illustrator)

Publisher: New York: Random

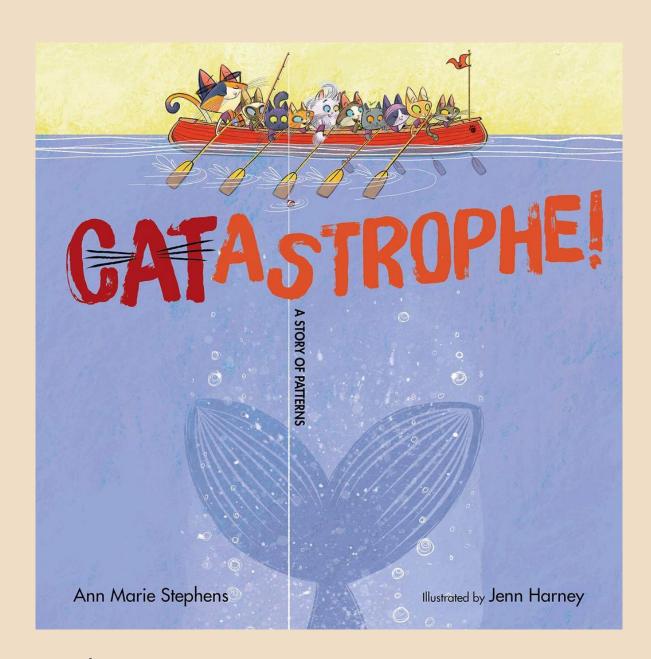
House, [2021]

Section: Early Literacy

Picture Books

Call Number: English GIL

Applied Mathematics



Catastrophe A Story of Patterns

By: Ann Marie Stephens & Jenn Harney (Illustrator)

Publisher: New York: Boyds Mills Press, an imprint of Boyd's Mills &

Kane, [2021]

Section: Early Literacy Picture Books

Call Number: English STE







Applied Mathematics



Catastrophe is about a group of cats who wish to go on a fun fishing trip. Let's learn about patterns as this kitty crew try to organise themselves!

Work with the hints in the book and explain to your child how the characters in the story illustrate them.



Point to the cats and ask
them if they recognise the
pattern core. Have them
guess what comes next in the
pattern!

Find patterns in your daily life; it could be how they arrange their toys or books, or have them create their own pattern.

Have your child point to the pictures and make guesses.

With patterns, ask them questions regarding positions.

Find patterns outside of the book. They can be colour, shape or size patterns.

More... on Applied Mathematics



The Marvellous Sugee Cake

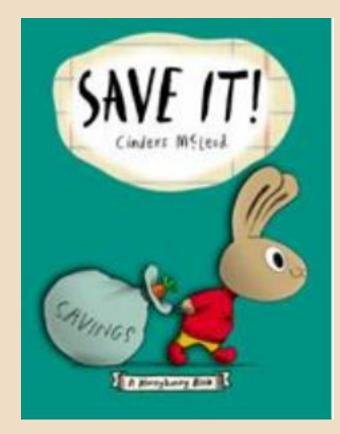
By: Quek Hong Shin

Publisher: Singapore : Epigram

Books, 2020

Section: Children Singapore

Call Number: English QUE



Save It!

By: Cinders McLeod

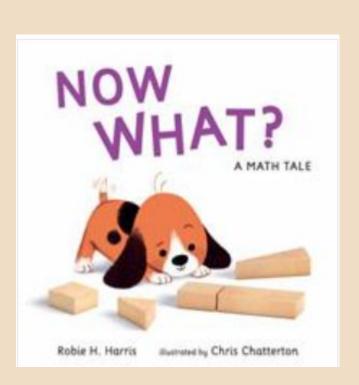
Publisher: New York: Nancy

Paulsen Books, [2019]

Section: Early Literacy Picture

Books

Call Number: English MAC



Now What?

By: Robie H. Harris & Chris

Chatterton (Illustrator)

Publisher: Somerville,

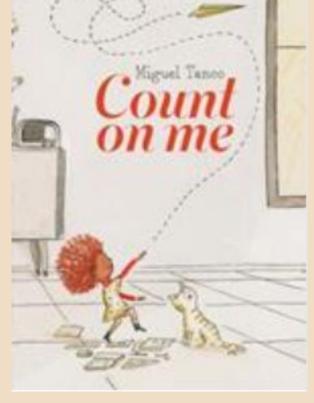
Massachusetts: Candlewick

Press, 2019

Section: Early Literacy Picture

Books

publishing companies. Call Number: English HAR



Count on Me

By: Miguel Tanco

Publisher: Toronto: Tundra, an

imprint of Penguin Random

House Canada Young Readers,

[2019]

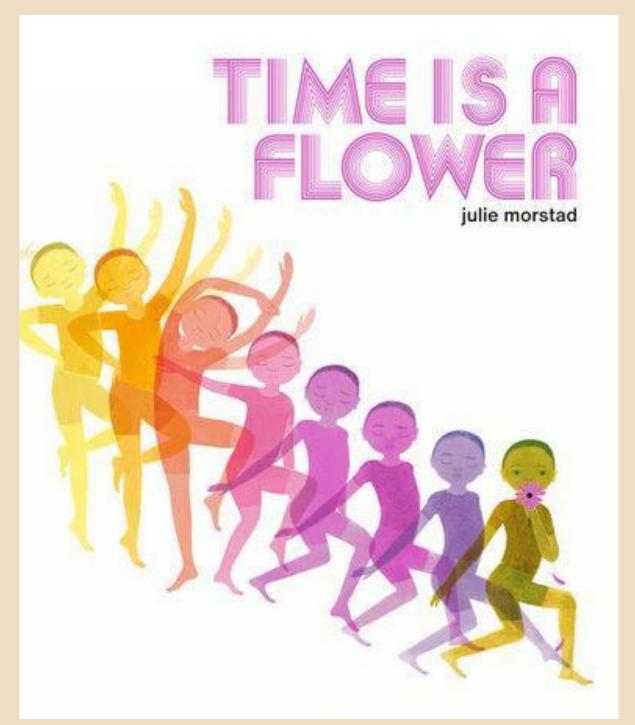
Section: Early Literacy Picture

Books

Call Number: English TAN



Applied Physics



By: Julie Morstad

Publisher: [Toronto, ON]: Tundra Books, [2021]

Section: Early Literacy Picture Books

Call Number: English MOR









APPLE DINSICS



How is time a flower? Does it grow? Does it move? Let's learn about an abstract scientific concept with this beautiful book.

Engage with the simple illustrations with the book; have your child point and ask them about the clock.



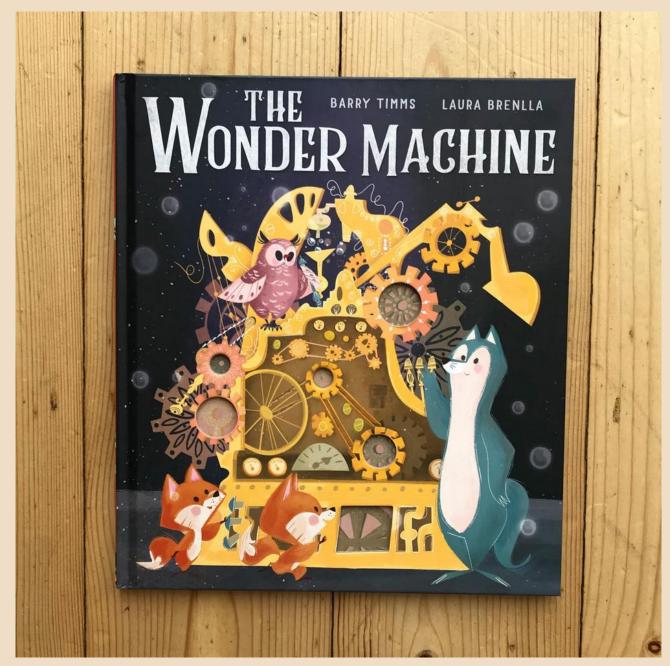
Have your child compare how objects change with time like flowers and shadows.

Encourage your child to make
comparisons and provide
scientific guesses or predictions.
Time is a changing constant.

You can even have them try and guess the names of the clock first.

As time is about progression, making comparisons is a good skill to learn through it.

Bring in concepts about age and growth too.



The Wonder Machine

By: Barry Timms & Laura Brenlla (Illustrator)

Publisher: London: Little Tiger Press Ltd, 2020

Section: Early Literacy Picture Books

Call Number: English TIM









A wolf inventor wishes to create the most wonderful machine in the world so that she can improve the life of others. But what of her own life?

Follow the wolf's journey with your child and ask them how she found these materials.



As your child flips the flaps, ask them what they observe and why characters do certain things.

Have your child identify these tools that aid us in inventing.

You can even show real examples!

Ask your child at the end if they remember the materials they found.

How did Wolf manage to get all the materials? Have your child make a logical guess.

Tools help little engineers.

Introduce them with this book.

More... on Applied Physics and Engineering



Elephant Island

By: Leo Timmers

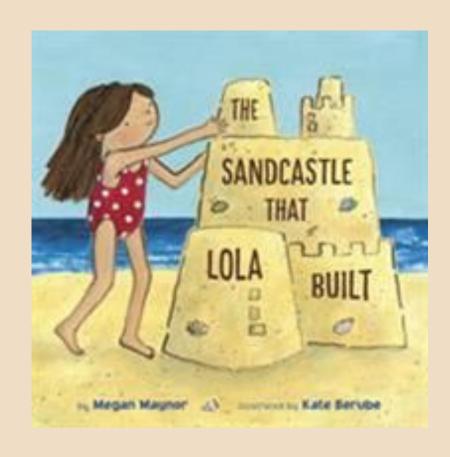
Publisher: Wellington, New

Zealand: Gecko Press, 2022

Section: Early Literacy Picture

Books

Call Number: English TIM



The Sandcastle That Lola Built

By: Megan Maynor & Kate Berube

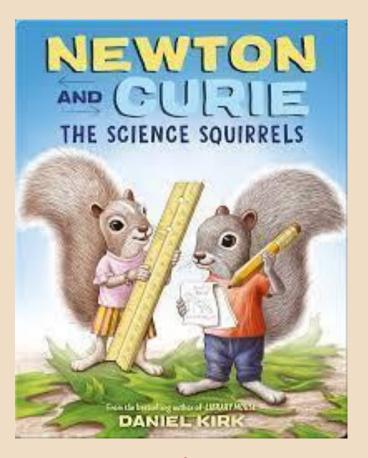
(Illustrator)

Publisher: New York: New York:

Alfred A. Knopf, 2018

Section: Early Literacy Picture Books Section: Early Literacy Picture

Call Number: English MAY



Newton and Curie: The

Science Squirrels

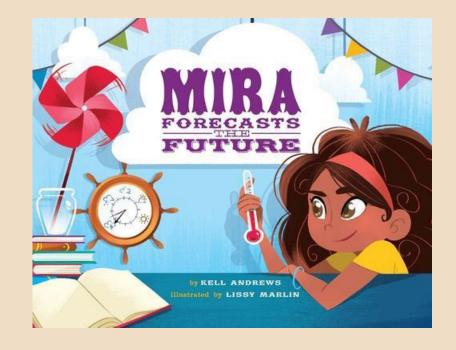
By: Daniel Kirk

Publisher: New York: Abrams

Books for Young Readers, 2020

Books

Call Number: English KIR



Mira Forecasts the Future

By: Kell Andrews & Lissy Marlin

(Illustrator)

Publisher: New York: Sterling

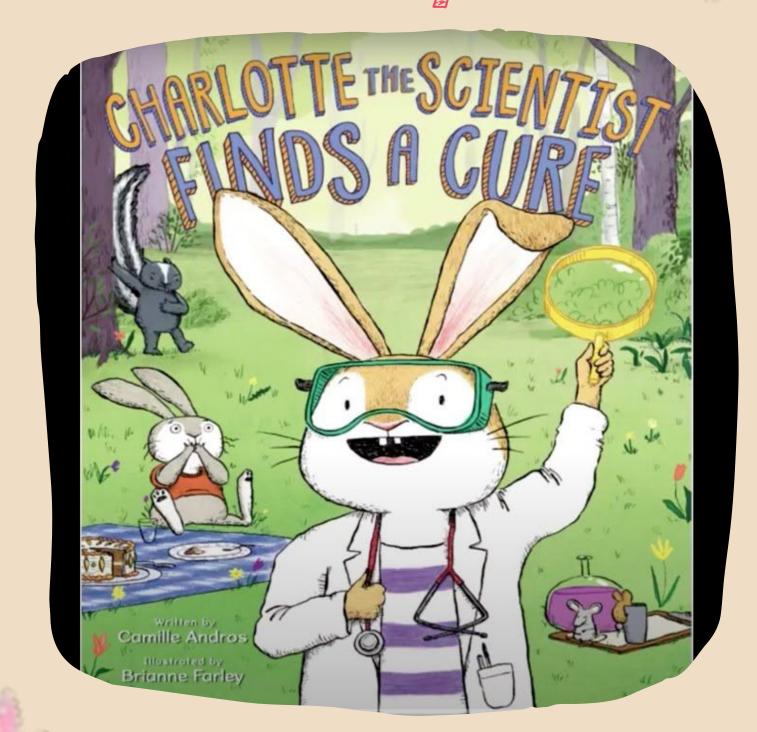
Children's Books, [2016]

Section: Early Literacy Picture

Books

Call Number: English AND

Biotechnology - Bacteria, Viruses and Genetics



Charlotte the

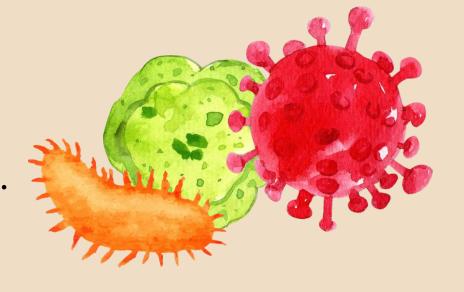
Scientist Finos a Cure

By: Camille Andros & Brianne Farley (Illustrator)

Publisher: New York; Boston: Clarion Books, [2019]

Section: Early Literacy Picture Books

Call Number: English AND







Biotechnolosy



A young rabbit with dreams of making a difference proves herself when a mysterious malady affects her friends and family.

Have your child assume the role of a doctor like

Charlotte!



Charlotte puts on protective equipment and performs tests.

These are what we see in hospitals.

The book argues that anyone can make a difference, no matter how small.

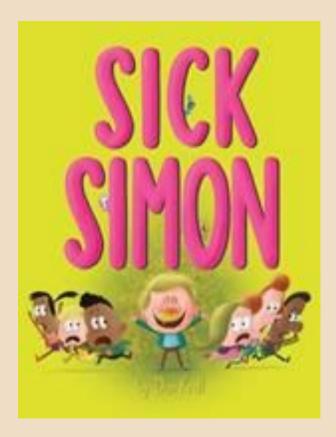
Have them make diagnosis like Charlotte in the book. Dress up and make it fun.

Test your child's knowledge.

Ask them what is the function of each of these equipment.

An encouraging mindset is necessary to bolster a passion for STEAM education.

More on Biotechnolosy



Sick Simon

By: Dan Krall

Publisher: New York: Simon &

Schuster Books for Young

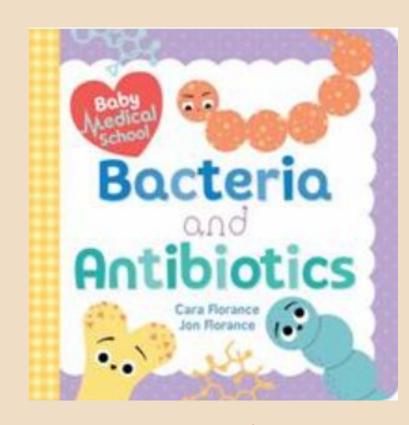
Readers, an imprint of Simon &

Schuster Children's Publishing

Division, [2015]

Section: Early Literacy Picture

Books



Bacteria and Antibiotics

By: Cara Florance

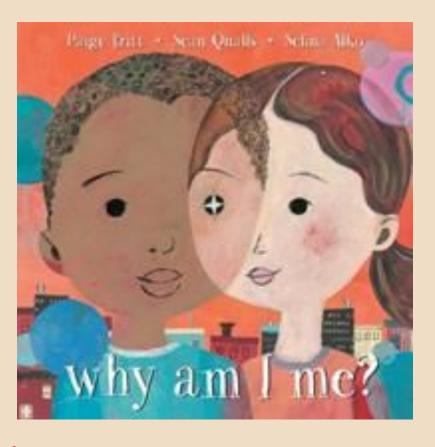
Publisher: Naperville, IL:

Sourcebooks explore, [2020]

Section: Early Literacy Sense &

Sensations

Call Number: English 579.3 FLO



Why am I Me?

By: Paige Britt, Sean Qualls & Selina Alko

(Illustrator)

Publisher: New York: Scholastic Press,

2017

Section: Early Literacy Picture Books

Call Number: English BRI







Butternut

By: Jill Dana & Rachel Tan-Hwee (Illustrator)

Publisher: Singapore : Marshall Cavendish Children, [2021]

Section: Early Literacy Picture Books

Call Number: English DAN







FOOD SCIENCES



A butternut squash is wondering what sort of food he is; is he a fruit, a vegetable or a nut?

Have your child point out
the adjectives used to
describe the foods.



Look at classification! An important part about Science is classifying things based on their properties.

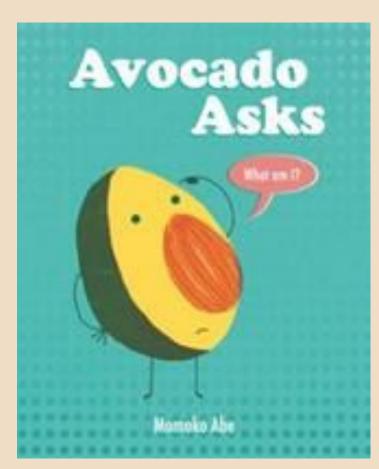
This story teaches your child how food is being processed and transported to the supermarket.

This leads your child to learn about different types of foods and their properties.

Draw up a table and have your child classify the foods accordingly!

The book offers a helpful infographic at the end that you can run through with your child.

Mores on Food Science



Avocado Asks "What am I?"

By: Momoko Abe

Publisher: New York: Doubleday

Books for Young Readers, [2021]

Section: Early Literacy Picture

Books

Call Number: English ABE



Are We Pears Yet?

By: Miranda Paul

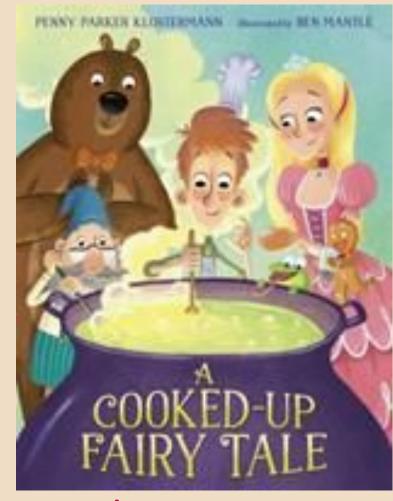
Publisher: New York: Roaring

Brook Press, 2017

Section: Early Literacy Picture

Books

Call Number: English PAU



A Cooked-Up Fairy Tale

By: Penny Parker Klostermann &

Ben Mantle (Illustrator)

Publisher: New York: Random

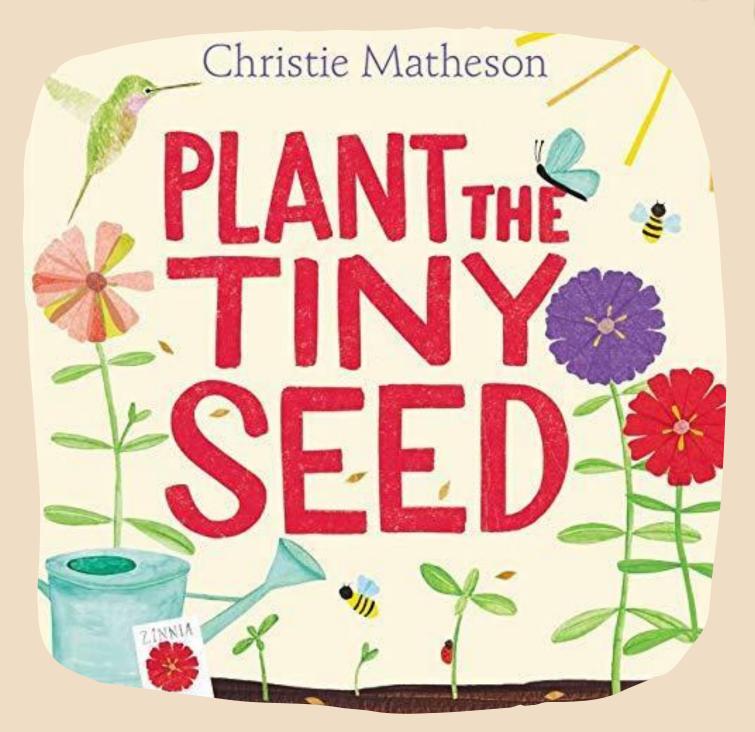
House, [2017]

Section: Early Literacy Picture

Books

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By: Christie Matheson

Publisher: New York: Greenwillow Books, an imprint of

HarperCollinsPublishers [2017]

Section: Early Literacy Picture Books

Call Number: English MAT









Plant the Tiny Seed introduces the STEAM concept of the natural world: Plants.

Children learn about the life cycle of a plant and what living things require to grow and develop.

There is always one focal point on each page. This tests observation and analysis.



The story encourages interaction. The child's participation is integral to the progress of the book.

Have your child tend to a simple potted plant to bring these concepts to life.

Have your child interact with these focal points.

Ask them what would be the potential effects of these actions.

Have them share with you what changes they see day by day.

More on Life Sciences



The Bug Collector

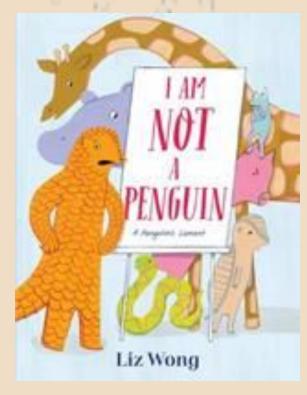
By: Alex G. Griffiths

Publisher: London, England: Andersen

Press, 2019.

Section: Early Literacy Picture Books

Call Number: English GRI



I Am Not a Penguin

By: Liz Wong

Publisher: New York: Alfred

A. Knopf, [2021]

Section: Early Literacy

Picture Books

Call Number: English WON



Little Acorn

By: Melanie Joyce & Gina

Maldonado (Illustrator)

Publisher: Northampton,

United Kingdom: Autumn

Publishing/Igloo Books, 2019

Section: Early Literacy

Picture Books

Call Number: English JOY







Enhance Learning Through Non-Fiction Books

Supplement Fiction with Non-Fiction

Fiction books introduce concepts to your children in an enjoyable manner.

Non-fiction books fill in the gaps of information and lead children to discover answers.

Ask your child what they have learnt to check understanding.

Revisit fiction books afterwards and ask them if they can recognise what they have learnt from non-fiction books.





Non-Fiction Books for Plant the Tiny Seed (Life Sciences)

My Life as a Dandelion

By: John Sazaklis

Publisher: North Mankato: Picture

https://nlb.overdrive.com/me

dia/6379253



By: Rachel Ignotofsky

Publisher: New York: Crown Books for Young Readers,

https://nlb.overdrive.com/2021

dia/5572588

Corpse Flower

By: William Anthony

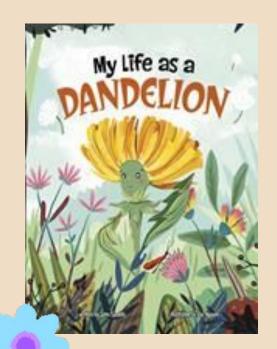
Publisher: New York, NY: Enslow Publishers,

2022

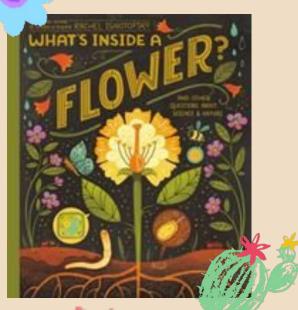
Section: Early Literacy Picture Books /

Non-Fiction

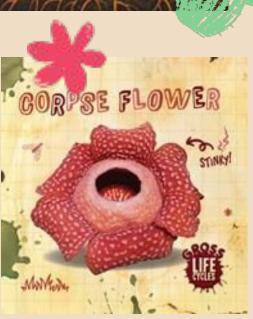
Call Number: English 584 ANT















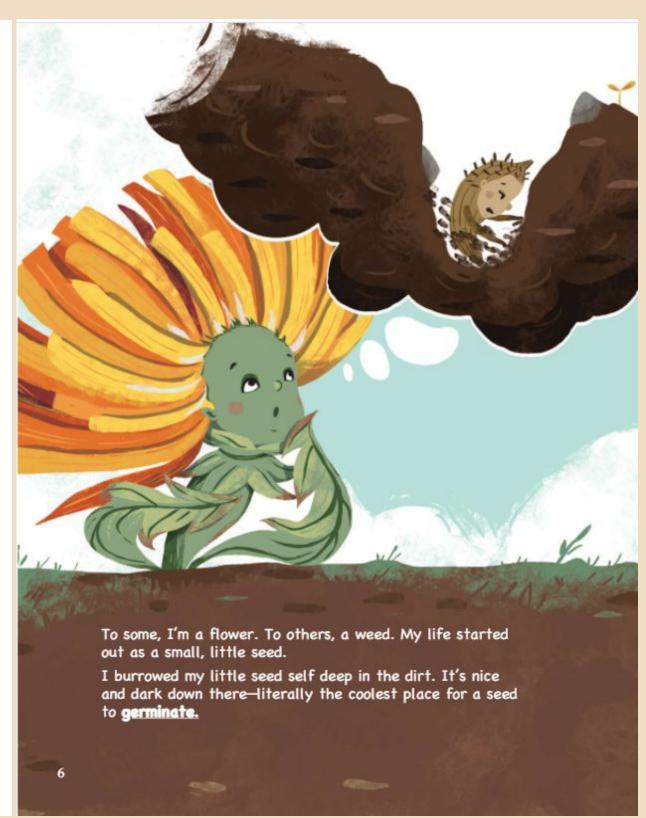
Non-Fiction Books for Plant the Tiny Seed (Life Sciences)



My name comes from the French words dent de lion. That means "lion's tooth."



My leaves are pointy, but they're nowhere near as sharp as a lion's tooth. Whoever came up with my name really did not do their homework.



My Life as a Dandelion

By: John Sazaklis

Non-Fiction Books for Catastrophe (Applied Mathematics)

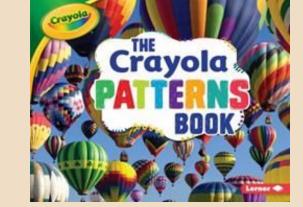
The Crayola Patterns Book

By: Marie C. Schuh

Publisher: Minneapolis: Lerner Publications, [2017]

Section: Early Literacy Picture Books / Non-Fiction

Call Number: English 511.3 SCH



Same and Different

By: Brenda McHale

Publisher: New York, NY: KidHaven Publishing, an imprint of Gareth Stevens

Publishing, 2022

Section: Early Literacy Picture Books / Non-Fiction

Call Number: English 516 MAC





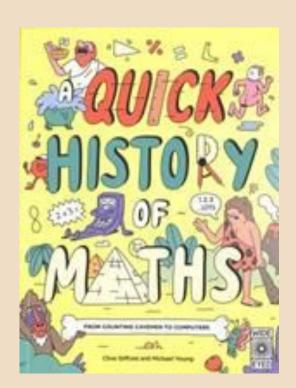
From Counting Cavemen to Big Data

By: Clive Gifford

Publisher: Beverly: Wide Eyed Editions, 2020

Section: Children / Non-Fiction

Call Number: English 510 GIF







Non-Fiction Books for Catastrophe (Applied Mathematics)



PATTERNS ALL AROUND

Our world is full of patterns. Patterns are colors, lines, and shapes that repeat.





Non-Fiction Books for Catastrophe (Applied Mathematics)

PEOPLE AND PATTERNS

Some patterns repeat shapes.



Many circles make a polka-dot pattern.



Chemistry

By: Veronica L. Murphy & Hilli Kushnir

Publisher: New York: Starry Forest Books, 2020

Section: Early Literacy Emergent Readers

Call Number: English 540 MUR



witten by Veronica L. Murphy

Studented by HIII Kushnir



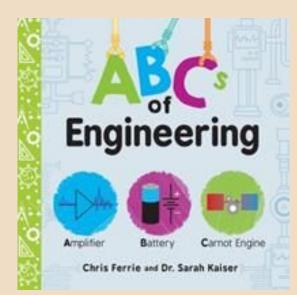
By: Chris Ferrie & Dr. Sarah Kaiser

Publisher: Naperville, Illinois: Sourcebooks Jabberwocky,

[2019]

Section: Early Literacy Emergent Readers

Call Number: English 620 FER



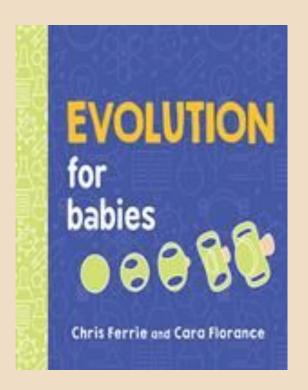
Evolution for Babies

By: Chris Ferrie

Naperville: Sourcebooks Explore, 2020



https://nlb.overdrive.com/me dia/4235758



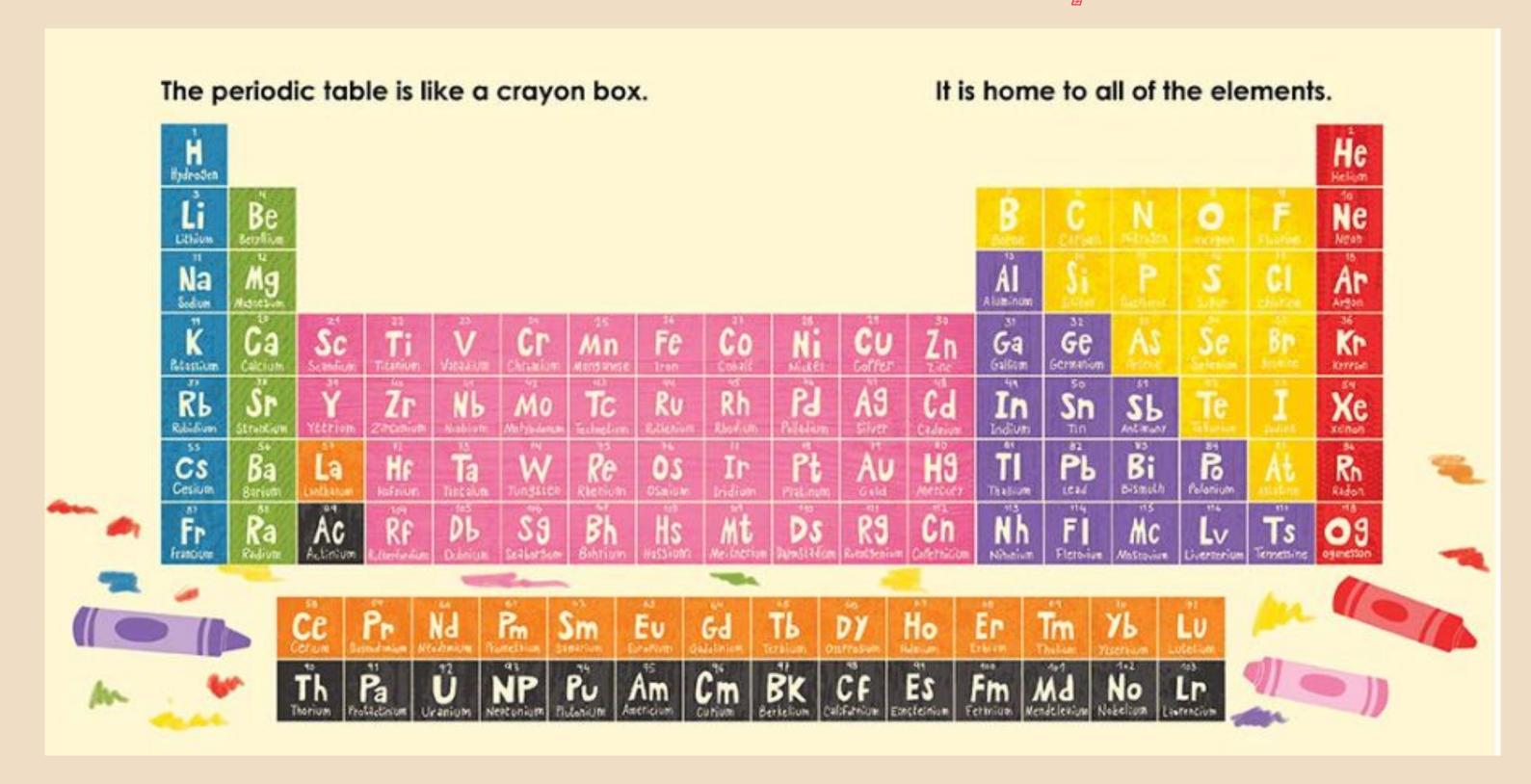


for the Tiny Tots!



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Non-Fiction Books for the Tiny Tots!



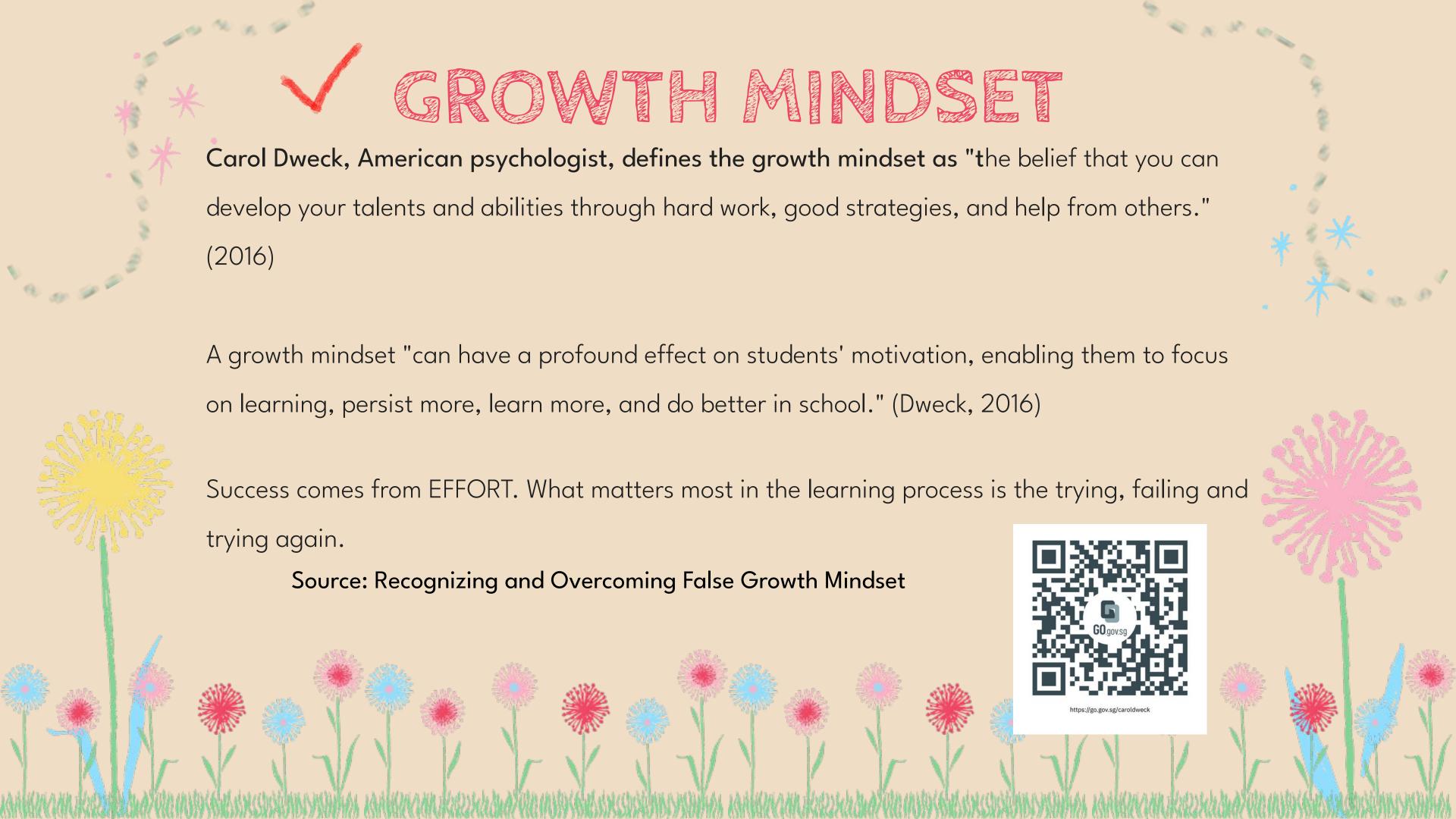
Non-Fiction Books for the Tiny Tots!

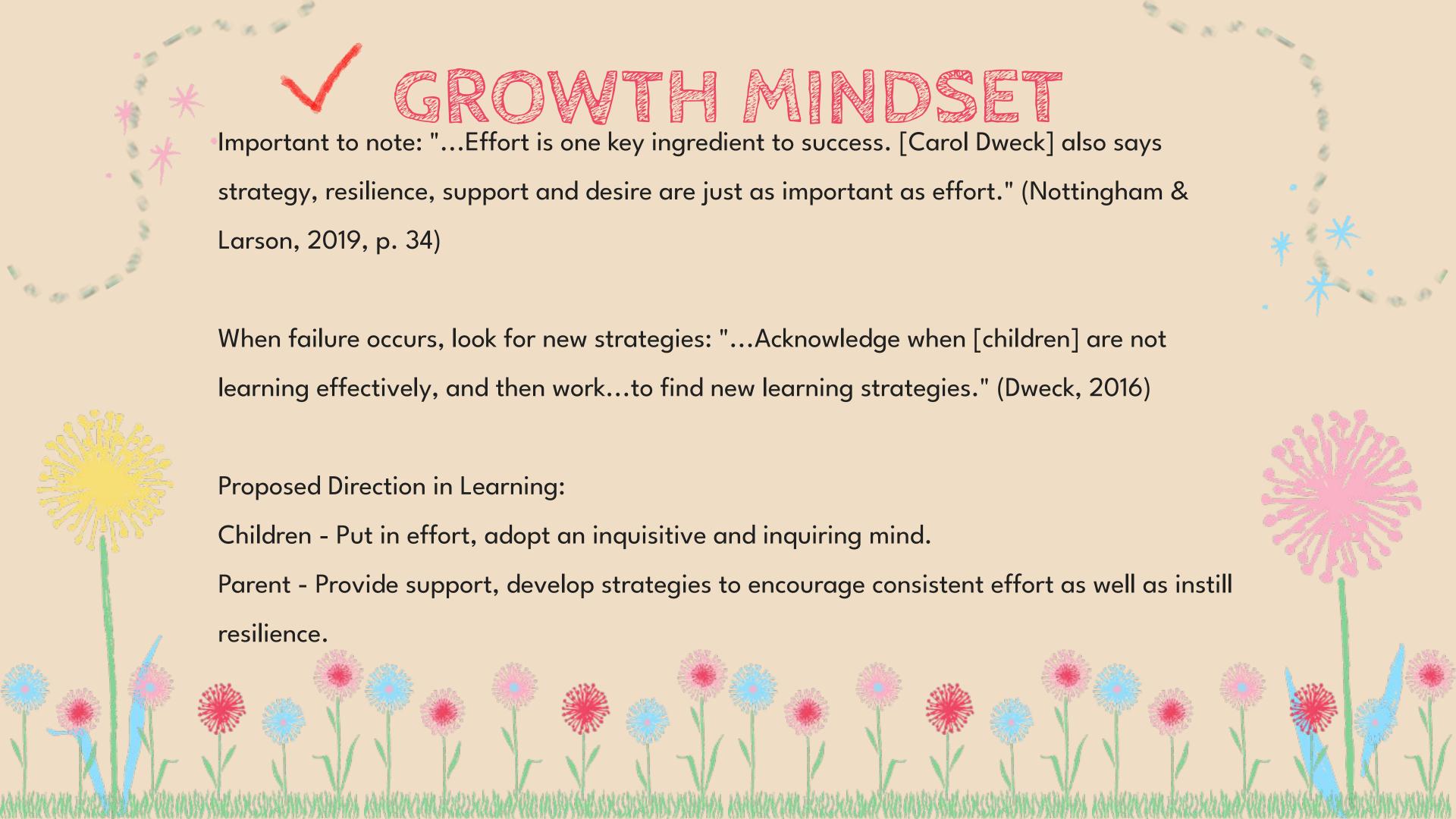




REPAGINE FORMARDI

Failure and Growth Mindset are Essential in STEAM





Developing Growth Mindset in STEAM



Great Science Fails

By: Barbara Krasner

Publisher: Minneapolis: Lerner Publications,

[2020]

Section: Early Literacy Picture Books /

Non-Fiction

Call Number: English 509 KRA

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A non-fiction book that discusses "the all-time biggest failures in science and how some of those flops actually led to great discoveries."

(Synopsis from NLB Catalogue)

This book emphasises failure, the importance of failure and how failure pushes the greatest scientists in history to move forward!

"Science is often a process of trial and error. Failure is a big part of learning and discovering."

(Krasner, 2020, p. 7)

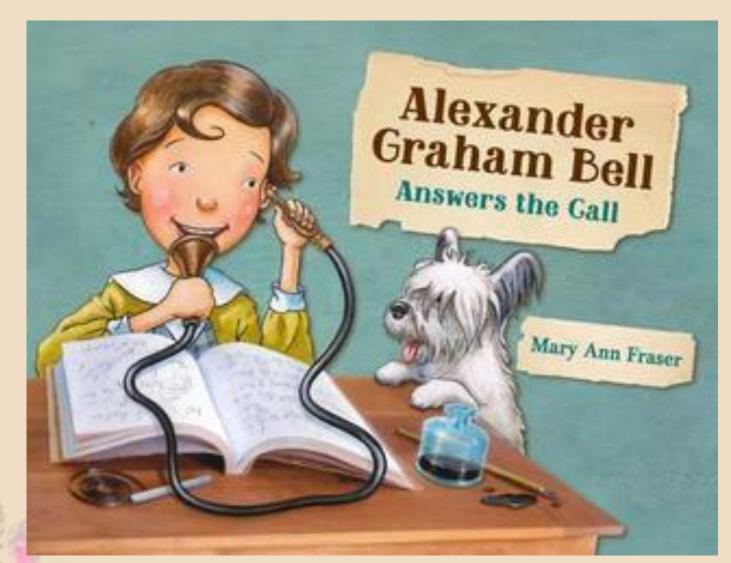
If we never get things wrong, how are we to be interested in learning the right things?





"Failure is unavoidable" (Krasner, 2020, p. 29)

Failure is Part of the Scientist's Story



Alexander Graham Bell Answers the Call

By: Mary Ann Fraser

Publisher: Watertown, MA: Charlesbridge, [2017]

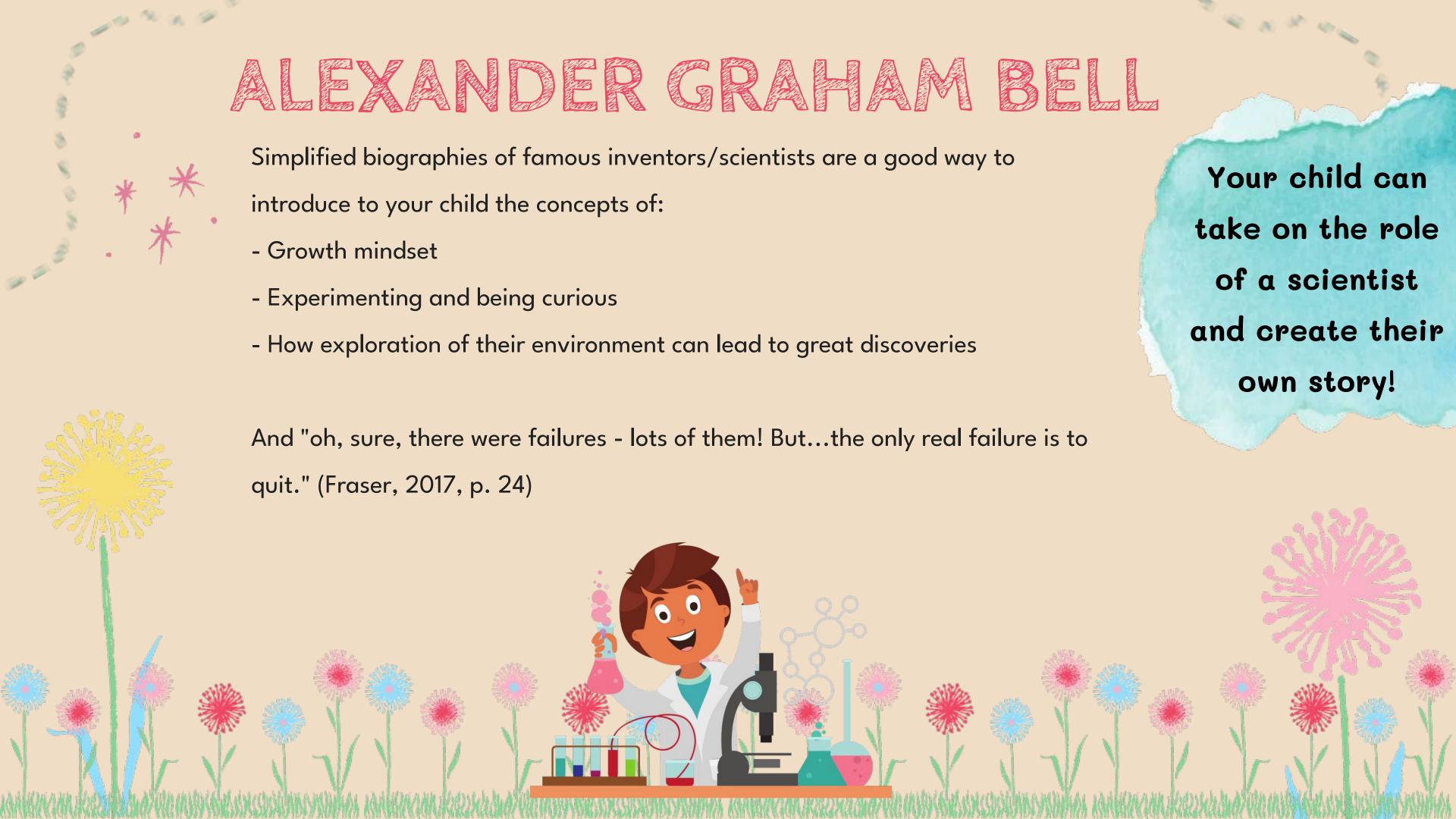
Section: Early Literacy Picture Books / Non-Fiction

Call Number: English 621.385092 FRA

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Tips To Developing Growth Mindset

1. A Love for Mistakes

 See failure as a learning opportunity and demonstrates how changes can be made in the future to get better

2. Using "Yet"

 Practise adding the word "yet" to challenges or problems faced, eg: "I haven't figured out how to do this yet."

3. Start with Yourself

• As an adult, you can demonstrate how you react to mistakes so that your child can model after you. Don't be afraid of emabarking on topics that you are not familiar with and take it as a learning process together with your child.



• Fraser, Mary Ann (2017) Alexander Graham Bell Answers the Call. Watertown,

MA: Charlesbridge, [2017] 9 March 2022

• Krasner, Barbara (2020) Great Science Fails. Thousand Oaks, Minneapolis:

Lerner Publications, [2020] 11 March 2022



• Baumgart, Nichole A. Kroll, Linda R. (2018) Steam Concepts for Infants and Toddlers. LaVergne: Redleaf Press, 2018. 9 March 2022

Nottingham, James. Larsson, Bosse. (2019) Challenging Mindset: Why a Growth
Mindset Makes a Difference in Learning - and What to Do When it Doesn't.

Thousand Oaks, California: Corwin, a SAGE Publishing Company, [2019]. 11
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Hadani, H. S., Regalla, L., Kennedy, K., Kauffman, J., Jaeger, G., Jaeger, G., Foushee, R., Eisenmann,
 & Rood, E. (2018). The roots of stem success.

https://bayareadiscoverymuseum.org/resources/publications. Retrieved April 28, 2022, from

https://37726n2dobnw25rhl01gna4e-wpengine.netdna-ssl.com/wp-content/uploads/2020/04/Roots_O

f_STEM_Paper_WORKING_v2.pdf

• Dweck, C. (2016, January 11). Recognizing and overcoming false growth mindset. Edutopia. Retrieved April 28, 2022, from

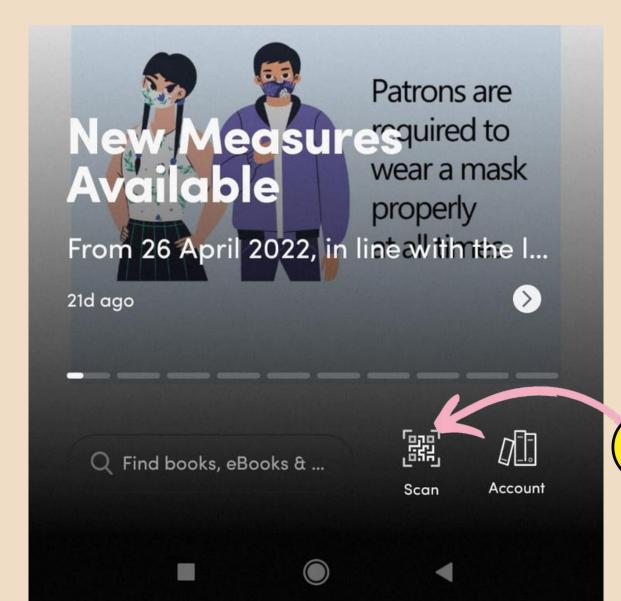
https://www.edutopia.org/blog/recognizing-overcoming-false-growth-mindset-carol-dweck

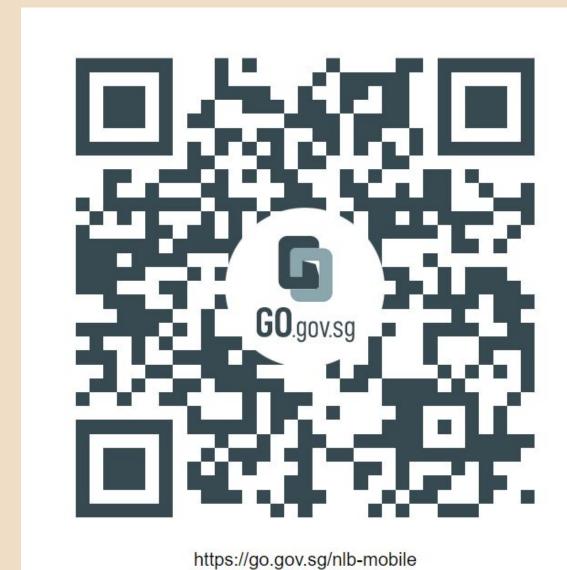
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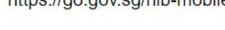


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https://go.gov.sg/earlyread-science-program

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NLB's Early READ EDM

https://go.gov.sg/earlyread-subscribe





ABOOKADAY READING PROGRAMME



Read a book a day with your child and stand to win a collection of children's books in a lucky draw! Terms and conditions apply. For participants aged 0 -6 years old upon registration only.



https://go.gov.sg/abookaday

READ WITH ME

ABOOKADAY READING CAMPAIGN



From April to June
2022, upload as many
Instagram posts of fun
storytelling sessions
that you have with your
child using the hashtag
#nlbabookaday and
stand to win attractive



https://go.gov.sg/abad-readwithme

START READING FROM THE CRADLE







https://account.nlb.gov.sg







go.gov.sg/progsurvey

