



Cracking the Literacy Code

Teaching Students to Read, Think & Write Across Subjects

Toni Robinson



Agenda

Overview

Vocabulary in Action

Disciplinary Reading

Academic Writing

Your Toolkit

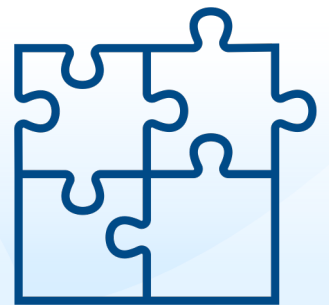
Action Plan



Let's *Connect*

At your table, introduce yourselves

- ✓ Share your context (grade level, role, location)
- ✓ Discuss: Where do you see your content area creating authentic opportunities for literacy development?



*I'm a **math** teacher,
not a reading teacher.*

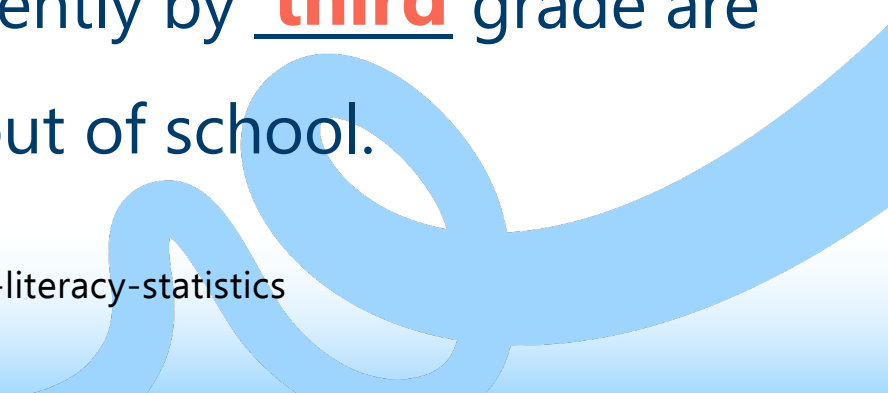
On average 79 % of US adults are literate.

54 % of adults have a literacy level below sixth grade.

20 % of Americans read below the level needed to earn a living wage.

Students who don't read proficiently by third grade are four times more likely to drop out of school.

<https://www.thenationalliteracyinstitute.com/2024-2025-literacy-statistics>

A large, stylized blue graphic element in the bottom right corner of the slide. It consists of several overlapping, rounded shapes that resemble waves or a ribbon, creating a sense of movement and depth.

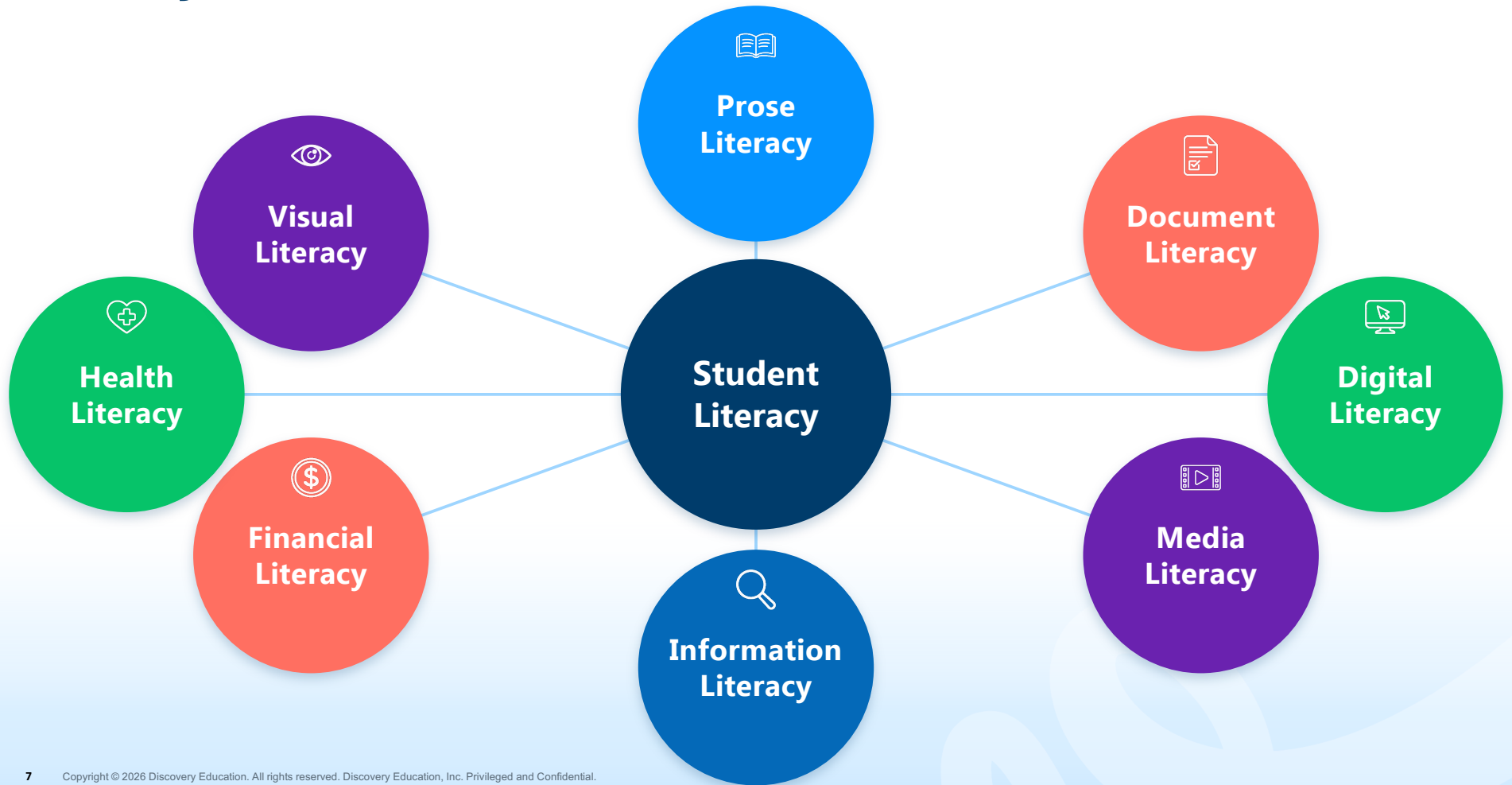
Can you think of any learning experience, in any subject, that does *not* include literacy?

Literacy is fundamental to *all* learning — it unlocks the wider curriculum.

Every teacher can create chances for students to explain their thinking, debate ideas, and read and write to grow their language skills.



The Many *Literacies* We Teach



What's ONE literacy challenge your students face that gets in the way of learning content?



Vocabulary in Action

Teaching Students to Read Like an Expert

"But kids with less overall knowledge and vocabulary
are always at a disadvantage."

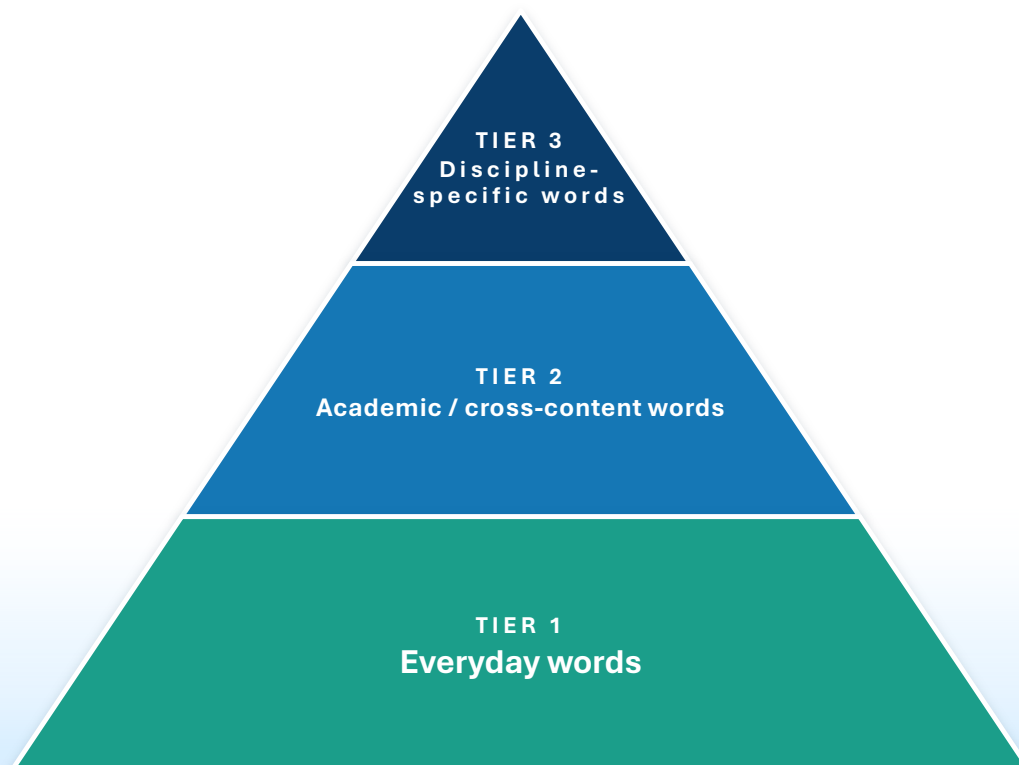
~Natalie Wexler, *The Knowledge Gap*

On the topic of assessments.

How do you teach complex
vocabulary to your students?

Tiers of Vocabulary

From everyday language to subject-specific terms



TIER 3 Discipline-specific words

Technical terms tied to one subject area.
e.g., photosynthesis, denominator, sonnet

TIER 2 Academic / cross-content words

High-use words that appear across many subjects.
e.g., analyze, compare, evidence, structure

TIER 1 Everyday words

Familiar words most students already know.
e.g., book, happy, school, run

Vocabulary Development

 Details

 Images

 Video

 Animation



Definition

a pull or push that is applied to an object

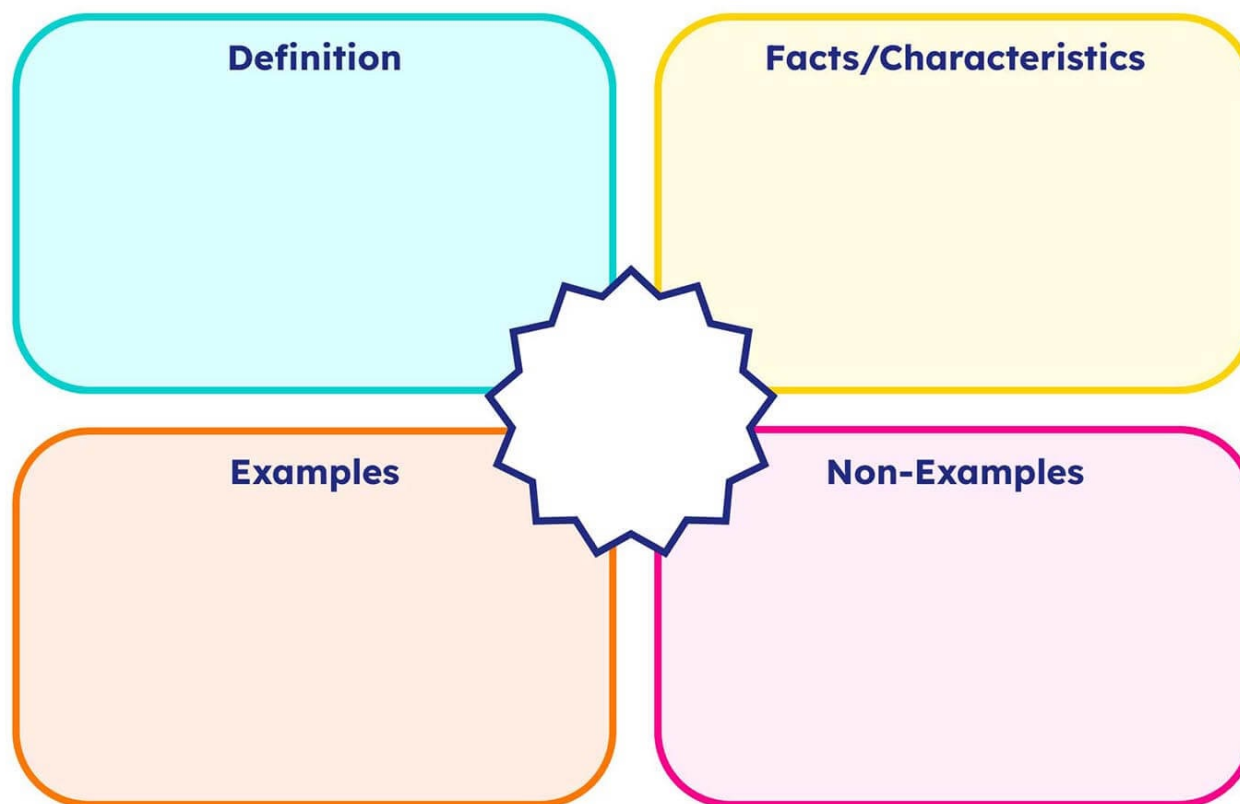
Key Context

What is the difference between a bowling ball and a soccer ball? A bowling ball is much heavier. It takes a lot of force to move a bowling ball. Force is a push or a pull on an object. In this case, the object is the bowling ball.

Vocabulary Development



Frayer Model



Vocabulary Development Strategies

SOS Instructional Strategy

CONCEPT CIRCLES

SKILLS

- Developing Vocabulary
- Identifying Key Ideas & Details
- Summarizing

BIG IDEA

Students use a Discovery Education video and a Concept Circle graphic organizer to visualize and analyze the relationship between vocabulary words within the content helps explain.

This strategy promotes a deeper understanding of vocabulary because students are asked to analyze terms and their connectedness to the central concept.

Vacca, R. T., & Vacca, J. L. (2001). Content area reading: Literacy and learning across the curriculum (7th ed.). Boston: Allyn &



MATERIALS

- Discovery Education video, audio, or text
- Pen or pencil
- Concept Circle graphic organizer

STEPS

1. Select a Discovery Education video, audio, or text related to your unit of study. Identify four concept-related vocabulary terms for the lesson.
2. Provide students with a copy of the graphic organizer. Share the four vocabulary terms with students and have them write a different term in each inner ring of the circle.
3. Explain that students will use the Discovery Education media to define the vocabulary terms and, ultimately, determine the concept that connects each of the terms.
4. Engage in vocabulary development discussions to ensure that students have a foundational understanding of the terms.
5. Have students view the media, pausing occasionally for students to add notes to the outer rings of the vocabulary terms.
6. Ask students to work with a partner to discuss word meanings and commonalities among the vocabulary. Together, the pair should come up with a concept and write it in the center ring.
7. Have students share their concept connections between the words, supporting their thinking with text-based evidence.

EXTENSIONS & MODIFICATIONS

- Provide students with two terms and have them determine two additional vocabulary words. Complete the process above.

VOCABULARY SCAVENGER HUNT

SKILLS

- Developing Vocabulary
- Identifying Key Ideas & Details

BIG IDEA

Students develop an understanding of new vocabulary and then demonstrate their understanding by clapping and defining the terms when they hear them in a Discovery Education video.

This strategy is used to transform media from a passive learning experience to an active learning opportunity, by asking students to engage while viewing a video.

Graves, Michael F. (2016) The Vocabulary Book: Learning and Instruction. New York, NY: Teachers College Press.



MATERIALS

- Discovery Education video

STEPS

1. Select a Discovery Education video related to your current unit of study.
2. Preview the video to determine 5 to 7 vocabulary words for students to define.
3. Display pre-selected vocabulary words to students.
4. Have students work in pairs to discuss the words to ensure they have an understanding of what each one means.
5. Call on students to share what each word means.
6. Explain to students that you'll be playing a video with these words embedded. Each time they hear one of the vocabulary words spoken, they should clap once.
7. Begin the video, pausing after you hear the first clap. Ask students to share what word they heard, what it means, and how it was used in context.
8. Repeat the process each time a word is used for the first time.
9. After the segment is complete, ask students to share other vocabulary words they

66 Robust vocabulary instruction (repeated exposure, student-generated examples, usage in context) significantly increases both reading comprehension and writing quality.



Disciplinary Reading

Teaching Students to Read Like an Expert

Before Reading

Reading Comprehension Strategies



Examine Text Structure

Readers preview the structure of the text, including titles, headings, vocabulary, and images.



Examine Vocabulary

Readers preview the vocabulary to help them determine familiar words, unfamiliar words, and words that will help them understand the text.



Examine Images

Readers view or take a “picture walk” through the images before reading to make inferences about what the text will explain.



Visualize the Text

Readers preview the text and create pictures in their minds to help them understand the text.



Determine Importance

Readers preview the text to get an idea of the important points.



Predict the Main Idea

Readers preview the text and make a prediction about what the text will mostly be about, based on their own prior knowledge and experience with the topic.



Ask Questions

Readers preview the text and ask questions to better understand the meaning of the text.



Set a Purpose to Read

Readers preview the text and set a purpose for reading, such as reading to find out how scientists know if a new substance forms.



Make Connections

Readers preview the text to determine if they can make connections between ideas in the text and with their own lives.

Agronomist

Get to Know the Career



What They Do

- Study soil health and crop conditions
- Recommend fertilizers and planting strategies
- Use data and drones to monitor fields
- Advise farmers on sustainable practices

Top Skills

- Scientific Inquiry
- Problem-Solving
- Data Analysis
- Communication

Projected Employment

U.S. Growth: 6 % increase through 2032.

dlc.com/CareerProfile-Agronomist



Typical Wages

→ Median for related roles was about \$78,770 in May 2024; those in research or consulting often earn \$100K+.

Job Outlook

Demand for sustainable agriculture and precision farming is rising as climate and food security take priority.



Where They Work

- Farms, research centers, and agribusiness companies
- Outdoor fieldwork and office analysis



Pathways Into the Career

- ✓ **Education Path:** Bachelor's in agronomy or agricultural science
- ✓ **Experience:** Farm or lab internships
- ✓ **Real-World Learning:** Plant growth experiments or school gardens

Similar Careers

- Soil Scientist
- Crop Consultant
- Irrigation Specialist
- Plant Biologist



Think About It: How can science and technology help us grow food more sustainably?

Which *discipline(s)* does this connect to?

What *vocabulary* would you need to introduce?

How would you build *background knowledge* and support reading comprehension?

The LIV GOLF logo is located in the top right corner. It features the word "LIV" in a stylized, bold, sans-serif font, followed by "GOLF" in a similar but slightly smaller font. The letters are white with a subtle shadow effect.

STEAM ON THE GREEN

THE SCIENCE BENEATH THE SURFACE

Activate Background Knowledge

Build Knowledge (purposeful reading, evidence-based writing, structured discussion)

Increase Comprehension

“ Disciplinary literacy means learning to use reading and writing as historians, scientists, mathematicians, and artists do—not just reading ‘texts about’ a subject.



Shanahan & Shanahan
(2012)

Read Like a Historian, Scientist or Mathematician

Discipline	Students Ask...	Students Notice...	Students Write...
Science	What is the phenomenon? What evidence supports the explanation?	Patterns, variables, cause and effect, data, models, and precise vocabulary.	A claim, evidence, and reasoning explanation.
Social Studies	Who created this? What perspective is represented? What evidence matters?	Source, context, point of view, chronology, continuity, change, and corroboration.	An evidence-based interpretation or argument.
Math	What is being asked? What information matters? What strategy makes sense?	Quantities, relationships, patterns, representations, constraints, and precision.	A justification of reasoning or explanation of a solution path.

Cognitive Strategies	Metacognitive Questions
Previewing	What do I already know about this topic ? What is the general structure ?
Making Connections	Does this remind me of anything I've done or read before ?
Clarifying	Is there anything I missed or need to try to better understand ?
Visualizing	Can I picture this in my mind ?
Questioning	What parts of this passage do I still need to figure out ?
Predicting	Can I think ahead about what might happen next?
Summarizing	What information do I know so far ?

Purposeful Reading



Animals and the environment



WILD WARNING
Some frogs have brightly colored skin to signal to potential predators that they are toxic.

More color changers

Chameleons (below) change color to communicate or attract mates. Goldenrod crab spiders turn yellow or white to hide among flowers. Many octopuses can also change color to blend into their environment. Arctic foxes and stoats transform from brown to white as summer turns to winter.



A male Asian common toad during breeding season

The secret of color-changing toads

Male Asian common toads are known for changing the color of their skin from brown to bright yellow for about two days every year. A new study has shown that this glow-up plays a key role in helping the toads find mates.

Asian common toads live in India and southeast Asia. When the first monsoons (heavy rains) occur in June, the toads engage in a two-day mass breeding event. Their eggs then have plenty of time to hatch, and the tadpoles can develop into frogs before the climate dries out in winter.

With so many toads looking for mates during such a brief breeding period, male toads may get confused and accidentally attempt to mate with other males,

different toad species, or even inanimate objects. Since males change to yellow while females stay brown, researchers believe the color shift helps males avoid each other during breeding time.

Previous research has revealed that male Asian common toads have special cells

called chromatophores below their skin, which produce colors with different pigments (substances that give color to animals or plants). When stress hormones are released in the toads' bodies, the cells rearrange themselves. This starts the process of turning yellow, which takes the toads about 10 minutes.

In the new study, researchers from the Schönbrunn Zoo in Vienna used special

instruments to scan the skin color of different toads. They used a computer model to confirm that the toads could distinguish between yellow and brown skin. Then the team 3D-printed model toads and placed them among a group of breeding toads.

The experiment showed that males often tried to mate with fake brown toads but mostly ignored the fake yellow ones. This was true even when the researchers changed other aspects of the models' appearance, such as their size. The findings suggest that male toads turn yellow as a sign to other males to stay away. "Identifying the correct mating partner can be difficult in these dense and stressful conditions," lead author Susanne Stücker told *National Geographic*. "Coloration appears to be one evolutionary solution to this problem."



The toads are usually brown.

The Week Junior

Science and technology



Using math to study how crowds move

Sometimes when you walk through a crowd, people move in an orderly line. But other times, people are all over the place and you have to zigzag in order to dodge them. In a new study, researchers determined the point at which crowds naturally go from orderly to disorganized.

Mathematicians at the Massachusetts Institute of Technology created computer simulations of people moving at different angles across spaces of varying widths. They also conducted an experiment with volunteers walking across a gym from different points.

The team found that crowd movement was determined by a measurement called "angular spread," which calculates the number of people

walking in different directions. Angular spread can change depending on whether people are walking in a narrow space, like a corridor, or moving through a wide open space, like a plaza.

Once a crowd's angular spread reaches 13 degrees or higher,

orderly pedestrians can spontaneously make a transition into a disorganized crowd.

Groups with an angular spread of 13 degrees or less, however, continue moving in lanes. The team also found that people moving in disorderly crowds had to walk slower than people moving in orderly lanes in order to avoid bumping into others.

The findings could lead to designs for public spaces that allow for more efficient movement, the scientists said.

WOW!
An intersection in Tokyo, Japan—called the Shibuya Crossing—is the busiest in the world, with 100,000 people passing through every hour.



Pedestrians naturally walk in certain patterns.

The Week Junior

Purposeful Reading

Science and technology



Surgery performed from 1,500 miles away

A surgeon in the UK recently carried out an operation on a patient who was 1,500 miles away, using a computer console and a four-armed robot. It was the first long-distance operation by a surgeon in the UK.

Prokar Dasgupta controlled the robot from London, England, while the patient, Paul Buxton, was in Gibraltar, a British territory on the south coast of Spain. Buxton had cancer, and Dasgupta needed to remove one of his organs in order to save his life.

During the surgery, a 3D high-definition camera on the robot let Dasgupta see what he was doing. The robot and the computer controlling it were connected by high-speed internet cables, with a backup wifi connection.

The signal delay was very brief (60 milliseconds)—so when Dasgupta performed a movement on his computer, the robotic arms in Gibraltar responded almost instantly. It felt “almost as if I was there,” the surgeon said. A medical team at the hospital in Gibraltar was also

standing by and ready to take over in case the internet connection failed.

Buxton said he felt “fantastic” days after the operation and called taking part in the surgery a “no-brainer.”

Without the robotic procedure, he would likely have had to travel to London and wait weeks for treatment.

Doctors hope remote surgery will help provide medical care to people who live far from major hospitals.

MEDICAL MILESTONE
In the first robot-assisted surgery in 1985, doctors removed a small part of a patient's brain with a needle.



Prokar Dasgupta performing the robotic surgery



The big debate

Should we get rid of plastic water bottles?

They're convenient, but they also cause harm to the environment.

What you need to know

- Plastic water bottles are single-use plastics, which means they're used once and then thrown out or recycled.
- About 83% of plastic water bottles aren't recycled. It takes about 450 years for a bottle to break down.
- Each day in the US, about 60 million plastic bottles end up in landfills. That's about 38 billion per year.
- Globally, more than 2 billion people do not have access to safe drinking water. Bottled water is an important resource for them.



THIRSTY HISTORY
Water was first bottled as long ago as the 1600s in the UK, then transported throughout Europe.

In the 1970s, US beverage companies started selling drinks in plastic bottles, and the light, convenient products were a huge hit. By 2023, bottled water was bringing in \$5.3 billion a year. As sales went up, however, so did the number of plastic bottles in landfills. Today, plastic drink bottles and their caps are among the top trash items in the ocean. Bans are being enacted in some places like New York state universities, which are phasing out all plastic water bottles by 2027. In Massachusetts, bottled beverages under 21 ounces are banned. But bottled water is still a necessity for some people. What do you think? Should we get rid of plastic water bottles?

Yes—they cause so much harm

Our planet needs help, and getting rid of single-use plastic water bottles would cut huge amounts of waste. It would also put a stop to the pollution that's generated during the bottle manufacturing process, which contributes to climate change. In addition, plastic water bottles break down into tiny particles, called microplastics, that spread through the oceans, air, and bodies of animals and people, causing health problems. The easiest solution would be for everyone to purchase a reusable bottle, which doesn't cost much more than a single-use bottle of water these days. People could stay hydrated and help the planet.

No—a ban wouldn't be fair

Plastic water bottles serve a vital purpose for the billions of people who don't have access to clean water. They rely on bottled water to eat, drink, and cook. Until that problem is solved, it's not right to have a total ban on plastic water bottles. Reusable water bottles sound good—but what if people forget theirs when they run out the door to go somewhere? If they can't buy a bottle of water that day, are they supposed to just go thirsty? Plus, there's the health factor. Making water convenient to drink means people will consume more of it, which is good for them. And they'll be less likely to buy sugary or artificially sweetened drinks instead.

YES Three reasons why we should get rid of plastic water bottles

- 1 It would help the planet by reducing waste and cutting back on pollution that contributes to climate change.
- 2 Plastic bottles contain tiny bits of plastics that get released into our oceans, air, and bodies, causing health problems.
- 3 Reusable water bottles are just as convenient and better for the Earth.

NO Three reasons why we should not get rid of plastic water bottles

- 1 Until everyone has access to clean water, it's not right to totally ban plastic bottles.
- 2 It's not realistic to expect people to always carry a reusable bottle. Sometimes you just have to buy water.
- 3 Without the convenience of plastic bottles, people will drink less water or turn to unhealthy drinks instead.

Grade 3-5

Inference

Full Video | 03:44



tails Transcript

Explicit Instruction



Segmenting
complex skills into
smaller
manageable tasks



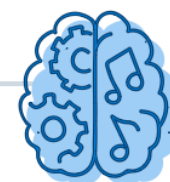
Modeling or
thinking-aloud to
address the
important features
of the content



Promoting
successful
engagement
using fading
supports and
prompts



Providing
feedback



Creating
purposeful
practice
opportunities

Content-area teachers who make their discipline's reading practices explicit- naming what experts do- produce significantly stronger readers and writers in their subject area.



Fang & Schleppegrell
(2010)

Academic Writing Across Content

Write to Learn, Not Just to Show

What does the *research* say?

According to a meta-analysis by Graham and Hebert (2010), having students *write* about the texts they were reading improved reading comprehension and the learning of information from the texts.

~as cited in Tim Shanahan 2022

Quick Writes

3-2-1

3 Things I learned

2 Things I want to explore

1 question I still have

Sentence Frames

I notice...

I wonder...

The evidence suggests.....

One pattern I notice is...

This connects to...

Claim, Evidence, Reasoning

What is your claim?

What evidence is presented to support your claim?

What reasoning can you use to tie the evidence to the claim?

NAME: _____

Observations: Watch the video, pausing frequently to record your observations below. Watch the video a **second** time without pausing and star next the **five most important things** to understand from the video.

Our Key Ideas: Compare your list of top five key ideas with a partner. Work together to consolidate your ideas into a single list and record below.

- 1.
- 2.
- 3.
- 4.
- 5.

Summary: Work with your partner and use your list of key ideas to create a one to two sentence summary.

Main Idea: Use your summary to create a word or phrase that identifies the main idea.

Connect

Focus Question:

List **details** from the text that are related to the focus question.

After reading, make **connections**. Use one of the following sentence stems, if needed:

I noticed a pattern between . . . and . . .
I can compare this concept to . . .
This event is similar to . . . because . . .
This idea is related to . . .

Reflect

Reflection Question:

Use the predictions, observations, and connections that you recorded to answer the reflection question. Be ready to share your ideas.

“ Students who write about content they are reading learn more of that content than students who only read it. Writing is a thinking tool, not just an assessment tool.



Graham & Hebert

(2010, Writing to Read)

The Mindset Shift

Literacy is Content. Content is Literacy.

Content literacy ≠ Teaching reading from scratch



What's ONE strategy from today that you plan to share, investigate or implement?



Your Summer Playbook for Tier 1 Instruction That Sticks

Join Bryan Goodwin, CEO of McREL Institute, and Stephanie Workman-Bolden, SVP of Partner Success at Discovery Education, for a practical session designed to help districts turn summer planning into stronger instruction this fall.

Virtual Event

Wednesday, July 8

1:00 PM ET | 10:00 AM PT

SCAN THE QR CODE OR VISIT bit.ly/4vMeGFf



DENSI 2026: Powering Progress

Join educators from across the country for hands-on learning, inspiring conversations, and practical strategies you can take straight back to your classroom.

July 14 & 15, 2026 / 10:00 – 3:00 PM ET



Move teaching forward | Practical, classroom-ready strategies educators can use right away to support student engagement, innovation, and growth.

Strengthen your impact with Discovery Education | Learn new ways to use DE tools more deeply, creatively, and confidently to amplify teaching and learning.

Connect with educators who get it | Join a passionate, supportive community of educators to share ideas, spark inspiration, and learn together - no travel required.

Stay ahead of what's next in education | Explore timely topics shaping today's classrooms, with guidance from trusted voices and experienced practitioners.



Register at the QR code or link below:
<https://bit.ly/4xzcBOE>

Session Schedule



Sunday, June 28

11:30 AM – 12:20 PM

Igniting Future Pathways:
Bringing Careers to Life with Free,
Real-World Learning



1:00 PM – 1:50 PM

AI in the Classroom: Practical Tools,
Smart Workflows, Future-Ready
Teaching Strategies

IBM SkillsBuild

Monday, June 29

8:00 AM – 8:50 AM

Igniting Innovators Breakfast:
Real World STEM Problem Solving
with 3M Young Scientists



9:30 AM – 10:20 AM

Beyond the Prompt: How AI Is
Transforming Student Creativity
and Engagement

10:30 AM - 11:20 AM

From Compliance to Curiosity:
Digital Citizenship in 2026



IBM SkillsBuild

1:00 PM – 1:50 PM

Pathways to Possibility Playground:
Career Readiness for All Students



Pathway to
Financial Success
to Schools

Soccer for
Success
Goals = Life

verizon
IMMERSIVE
LEARNING

3:00 PM – 3:50 PM

From Curiosity to Citizenship:
Building Civic-Minded Learners
Through Inquiry & 3D Modeling

Tuesday, June 30

10:00 AM – 10:50 AM

Cracking the Literacy Code:
Teaching Students to Read, Write
& Think Across Subjects



Discover
Literacy

11:00 AM – 11:50 AM

Building a Systemwide Instructional
Model That Makes Learning Stick

1:00 PM – 1:50 PM

From Telling to Thinking: Disrupting
Math Instruction That Doesn't Work

2:00 PM – 2:50 PM

Valuable Screen Time!
How Industry Partnerships Bring
the World to Students

verizon | IMMERSIVE
LEARNING

Wednesday, July 1

10:00 AM – 10:50 AM

Hands-On Tech &
Career Skill-Building



Our Vision & Mission

To be the most trusted learning partner, equipping educators, and engaging students to succeed in a dynamic world.

Inspire *Curiosity*

Build *Confidence*

Accelerate *Learning*



Teaching & Learning *Solutions*

Award-winning supplemental, intervention, and core curriculum across subjects



Ready-to-teach cross-curricular content, lessons, teacher tools, and career exploration

K-5 6-8 9-12



Personalized program that builds foundational skills and silent reading fluency

PreK-3



Develops proficiency in silent reading fluency, vocabulary, and comprehension

3-5 6-8 9-12



Personalized program that supports learning acceleration and confidence in math.

K-5 6-8



Open-and-go science lessons and hands-on activities

K-5



Open-and-go writing instruction and exercises

K-5



Rigorous science curriculum, built for the NGSS

K-5 6-8 9-12

DE PARTNERSHIPS

Unique partnerships that support enhanced assessment and timely, relevant content

K-5 6-8 9-12



Inquiry-based social studies curriculum builds critical thinking skills

6-8



500+ phenomena-based interactive science activities

9-12



Thank You!