

The New Science of Vocabulary: How AI Can Support Language Learning

Elfrieda (Freddy) H. Hiebert
TextProject



PHONEMIC AWARENESS

PHONICS

FLUENCY

VOCABULARY

COMPREHENSION

Overview: Using AI to....

Analyze

Analyze School Texts and Tasks



Select

Select Specific Words & Texts



Enhance

Enhance Explicit Vocabulary Instruction



1. Analyzing Vocabulary in School Texts

Oxford Unabridged Dictionary

•282,500
root or head
words

•326,000
derivatives
& phrases

•47,150
obsolete
words

And this doesn't include the
multiple meanings of words.

Long-standing Approach in Selecting Words to Teach: “Cherry-picking”



slender
gallant
chimed
preparations
flickered
concluded

Research on the efficacy of “cherry-picking “ vocabulary”:

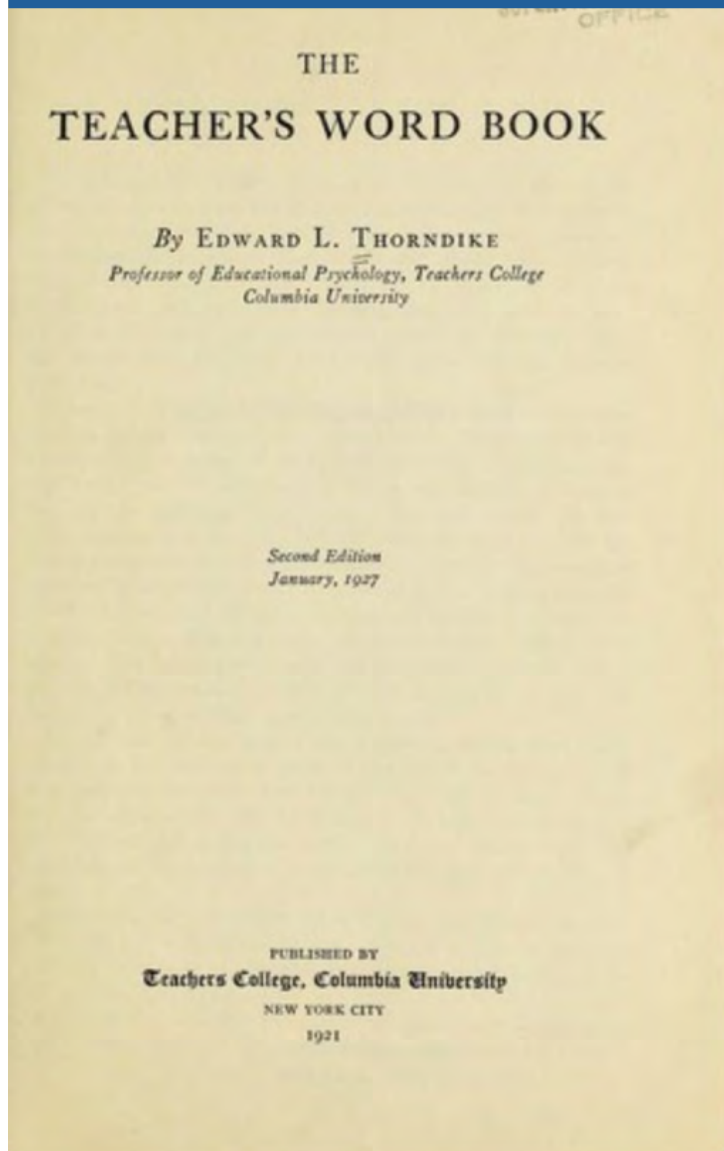
- on comprehension (Wright & Cervetti, 2017)
 - on vocabulary (beyond taught words) (Cervetti et al. (2023)

Big Data & Shifts in Opportunities for Vocabulary Learning

Available Corpora

(Large Collections of Words
from Texts)

1st Corpora for educators : *Thorndike's Teacher's word book, based on 5 million words from the Bible, Farmer's Almanac and some children's books like The Secret Garden*)



A to Acre					
a	208	1a1	abuse	21	3b
Aaron	6		abyss	9	
abandon	17	4a	academy	9	
abash(ed)	4		accent	14	4b
abate	10	5b	accept	47	2a
abbey	9		acceptance	9	
abbot	7		access	11	5b
abdomen	5		accessory	4	
Abe	3		accident	26	4a
abed	5		accidental	5	
Abel	5		accommodate	10	5b
abhor	14	4b	accommodation	8	
abide	18	4a	accompaniment	3	
ability	16	4a	accompany	34	2b
abject	7		accomplish	31	2b
able	70	1b	accomplishment	5	
aboard	15	4b	accord	16	4a
abode	17	4a	accordance	8	
abolish	10	5b	according	48	2a
abominable	9		accordingly	20	3b
abomination	5		accost	5	
abound	10	5b	account	63	1b
about	172	1a1	accumulate	3	
above	101	1a3	accurate	3	
Abraham	14	4b	accursed	13	5a
abridge	4		accusation	8	
abroad	23	3a	accuse	22	3b
abrupt	7		accuser	5	
absence	22	3b	accustom	26	3a

Corpora of School Text Available in 2020s

- TASA database (Zeno et al., 1995): Contains ≈ 17 million words from Grade 1-college texts with grade-level data
- TextProject's TextBase: Consists of ≈ 9 million words from trade books and content area, leveled, and decodable texts. Words are distributed across 6 grade bands.

Big Data & Shifts in Opportunities for Vocabulary Learning

Available Databases of
Word Features



**Word Zone
Profiler,
2000**

Word	High Frequency	Count	Decodability
a	HF	54	1
all	HF	3	6
and	HF	12	3
around		1	8
backpack		3	8
bark		1	6
bat		1	2
be	HF	2	1
bear		2	5
bears		1	5
bell		1	6
bet		1	2
big		1	2
bird		3	6
blue		1	5
book		1	7
boy		1	7
brown		1	7
bug		1	2
butterflies		1	8
butterfly		7	8


Word	Frequency	Word Length	UFunction	WordZone	Supercluster	Megacluster	Age of Acquis	Dispersion	Complex Mor	Number Mor	Academic Vo	Academic Vo	Family	Rime Family	POS	Mean Concrete
a	54	1	24070	1	3i.1	10	2.893384	0.9982	24070	1					Article	1.46
all	3	3	3370	1	3g.3	10	4.239515	0.993	3370	1			all o	5	Determiner	2.27
and	12	3	27594	1	27b.1	8	4.569882	0.9972	27594	1			and a	11	Conjunction	1.52
around	1	6	812	2	2x.6	6	5.944635	0.9488	970.8567	9			N/A		Adverb	1.96
backpack	3	8	1	7	22a.10	12	5.38	0.5716					N/A		Noun	4.96
bark	1	4	33	4	19d.1	2	5.17	0.7438	48.0554	6			N/A		Noun	4.52
bat	1	3	16	5	34c.2	13	4.85	0.7618	36.6359	9			at a	8	Noun	5
be	2	2	5272	1	50a.1	14	5.11	0.9733	36725	9	633	4416	e		Verb	1.85
bear	2	4	122	3	4e.7	11	3.58	0.7342	175.3104	18			ear e	22	Noun	4.88
bears	1	5	122	3	4e.7	11	3.58	0.7885	175.3104	18			ear e	22	Noun	4.88
bell	1	4	58	4	19b.2	2	3.89	0.8452	69	3			ell e	37	Noun	4.96
bet	1	3	17	5	42c.4	4	7	0.4367	19	3			et e	36	Verb	3.1
big	1	3	517	2	3a.3	10	2.89	0.8135	598.5284	6			igi	73	Adjective	3.66
bird	3	4	121	3	4j.1	11	3.52	0.7461	222.457	7			ird er	N/A	Noun	5
blue	1	4	162	3	58a.1	10	3.53	0.856					ue u	85	Adjective	3.76
book	1		290	3	15c.1	13	3.68	0.9521	480.2457	11			ook u	32	Noun	4.9
boy	1		292	3	9c.1	5	3.67	0.7393	513.7697	7			oy oi	86	Noun	4.76
brown	1		128	3	58a.1	10	4.196887	0.8545					ow ow	7	Name	4.48
bug	1		13	5	4k.1	11	3.79	0.5543		5			ug U	N/A	Noun	5
butterflies	1			6	4k.1	11	3.67	0.6488					N/A	N/A	Noun	4.93
				6	4k.1	11	3.67	0.7162					N/A	N/A	Noun	4.93

Word Zone Profiler, 2020

word	Freq_HAL	AoA_Kuper	AoA_LWV	AoA_Glasgow	Freqtraj_TASA	Cumfreq_TASA	DPoS_Brys	NLet	OLD20	OLD20F	Orth_N	Orth_N_Freq	Orth_N_Freq_G	Orth_N_Freq_G_Mean	Orth_N
Article	16.177	2.893384	2.01871		0.185579101	10.10967809	Article	1	1.45	9.831	5	13	0		
Determiner	14.346	4.239515	3.48872969	1.807	-0.19898142	7.912225988	Determiner	3	1.2	8.693	9	6.8	0		
Conjunction	16.187	4.569882			0.318048484	10.19212895	Conjunction	3	1.25	9.101	11	9.4	0		
Noun	7.567	5.38			-1.88449054	-1.355794054	Noun	8	3	5.872	0				
Noun	8.775	4.85	4.68593011	2.922991657	-1.79491442	1.342308296	Noun	3	1	9.45	26	9.1	15	10.6	
Noun	9.031				-0.97922601	2.735553143	Noun	5	1.1	7.727	20	7.5	2	10.9	
Verb	10.306	7	6.78685054		-2.24244546	1.662282169	Verb	3	1	10.158	21	10	9	12.2	
Adjective	12.093	2.89	2.83	563	-1.50526193	5.736890943	Adjective	3	1.1	8.74	19	8.5	0		
Noun	9.856	3.52	3.72	2.097	-1.35181422	3.957040527	Noun	4	1.75	8.476	5	6.6	0		
Adjective	11.396	3.53	3.3	1.882	-0.89060314	4.368437232	Adjective	4	1.75	7.722	6	6.3	0		
Noun	10.665	3.67	2.99	1.424	-1.35398419	5.011019009	Noun	3	1	8.508	20	8.4	3	11.6	
Name	10.648	3.18993	2.94	1.39	-0.84037152	4.090860612	Name	5	1.6	7.882	8	6.9	0		
Noun					-2.08833269	1.365572612	Noun	3	1.05	8.434	20	8.5	4	12.2	
Noun					0.95169584	0.599089712	Noun	11	4.4	5.45	0				
Noun					0.707422968		Noun	9	3.25	5.577	0				

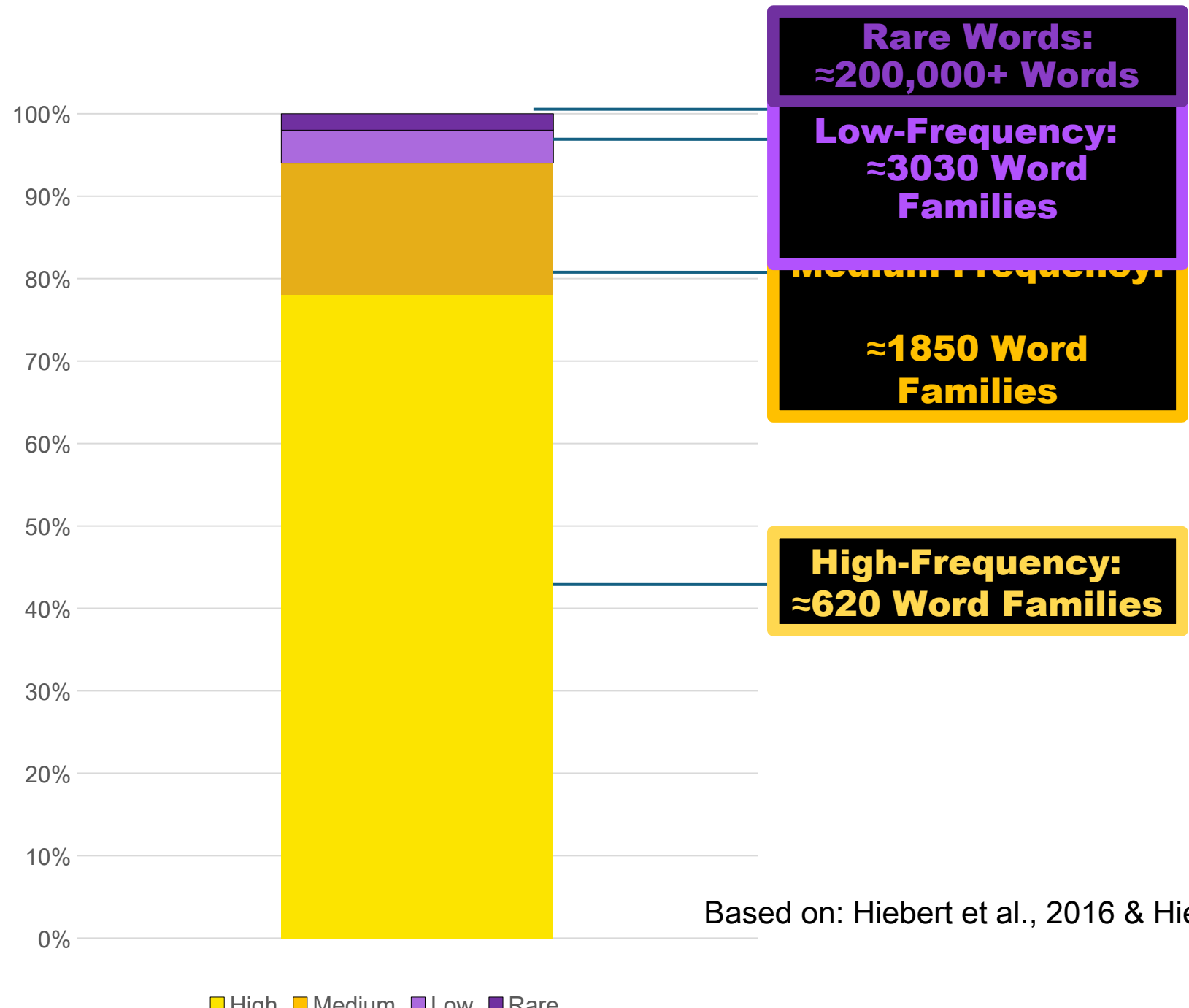
SCOPE, 2024

0	bʌ 'tə-flaj	4.93		6.452		6.765		6.37		5						
211765	kæ'n	4.55						3.63		8						
157.7375		174.163		655	256	1617	616	10	1	0.6	0.529	12	8.523	0.9		
119.5593333		148.221		543	275	2325	925	20	2.2	0.35	0.011	6	6.23			
98.0575		105.545		701	143	1442	288	16	1.94	0.75	0.212	18	8.237	0.9		
32.702		35.488		11	6	45	33					0	0.9			
108.66		124.58		200	40	483	115	20	2.15	0.2	0.076	0	0.9			
81.3715		95.041		103.976	357	950	279	20	1.95	0.58	0.12	19	9.786	0.8		
0.435940449	0.465329232	0.985815603	0.006918239	1	0.035532995	0.952380952	0.596129558	0.999346405	0.258823529	0.01046386						
0.030660377	0.251485917	0.512246239	1	0.238095238	0.820512821	0.617853687	0.294117647	0.01126272								
0.985815603	0.911330432	0.733133433	0.780530973	0.991967871	0.714285714	1	0.894520032	0.999346405	0.336091453	0.93560606						
0.50583686	0.294171745	0.37104175	0.91517478	0.573636597	0.863303438	0.848158131	0.552828359	0.750620261	0.701366249	0.285486903	0.874588705					
0.91517478	0.45623436	0.441891875	0.571463014	0.91517478	0.536628932	0.998832786	0.848158131	0.541707435	0.768100413	0.701366249	0.311862529	0.95909111				
0.893358634	0.978628837	0.992299186	0.967598598	0.893358634	0.481889205	0.931099476	0.559027776	0.74267101	0.72160922	0.91953125	0.99511122	0.96296296				

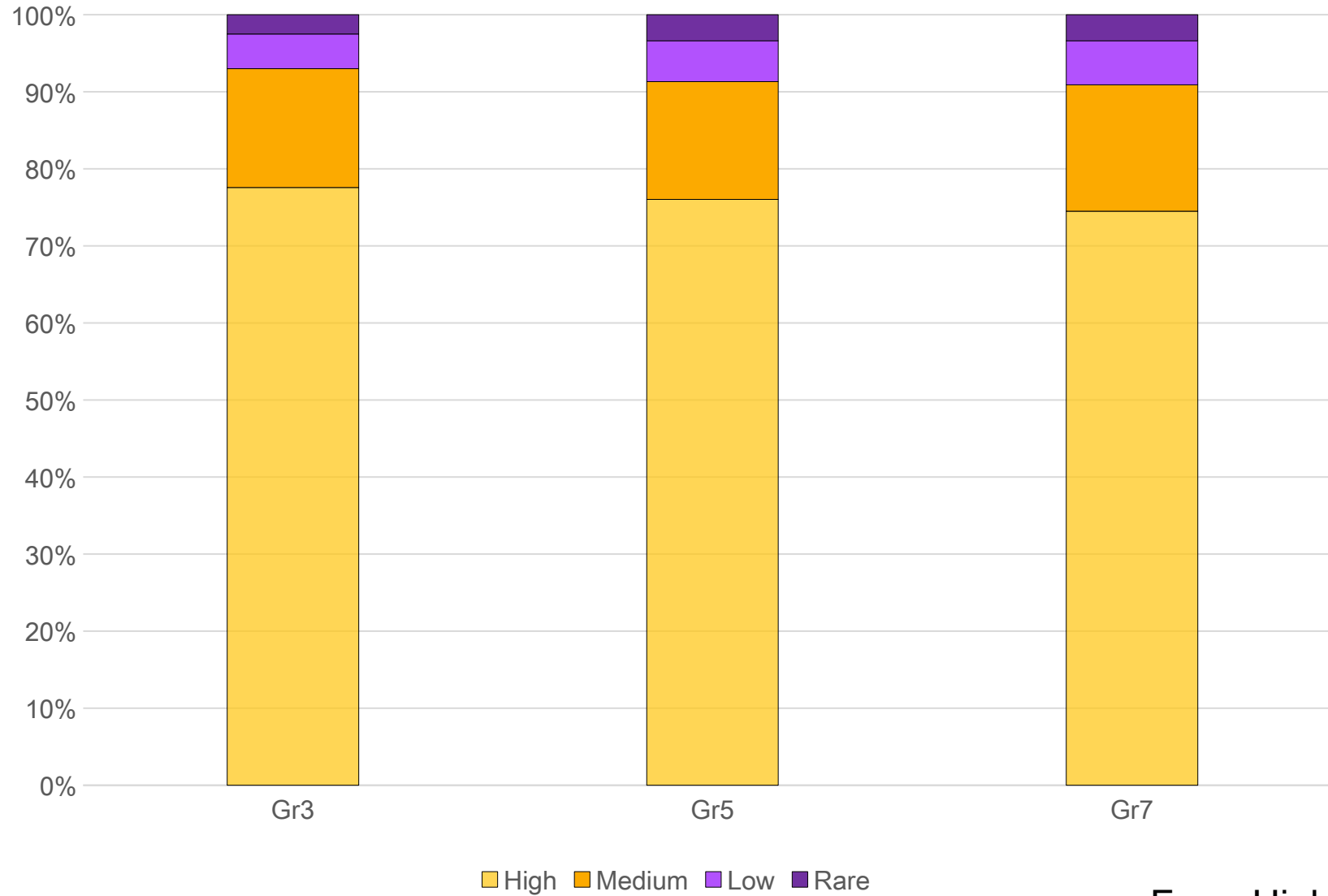


What does this information from big data sets allowed us to learn about vocabulary?

Word Distribution in School Texts

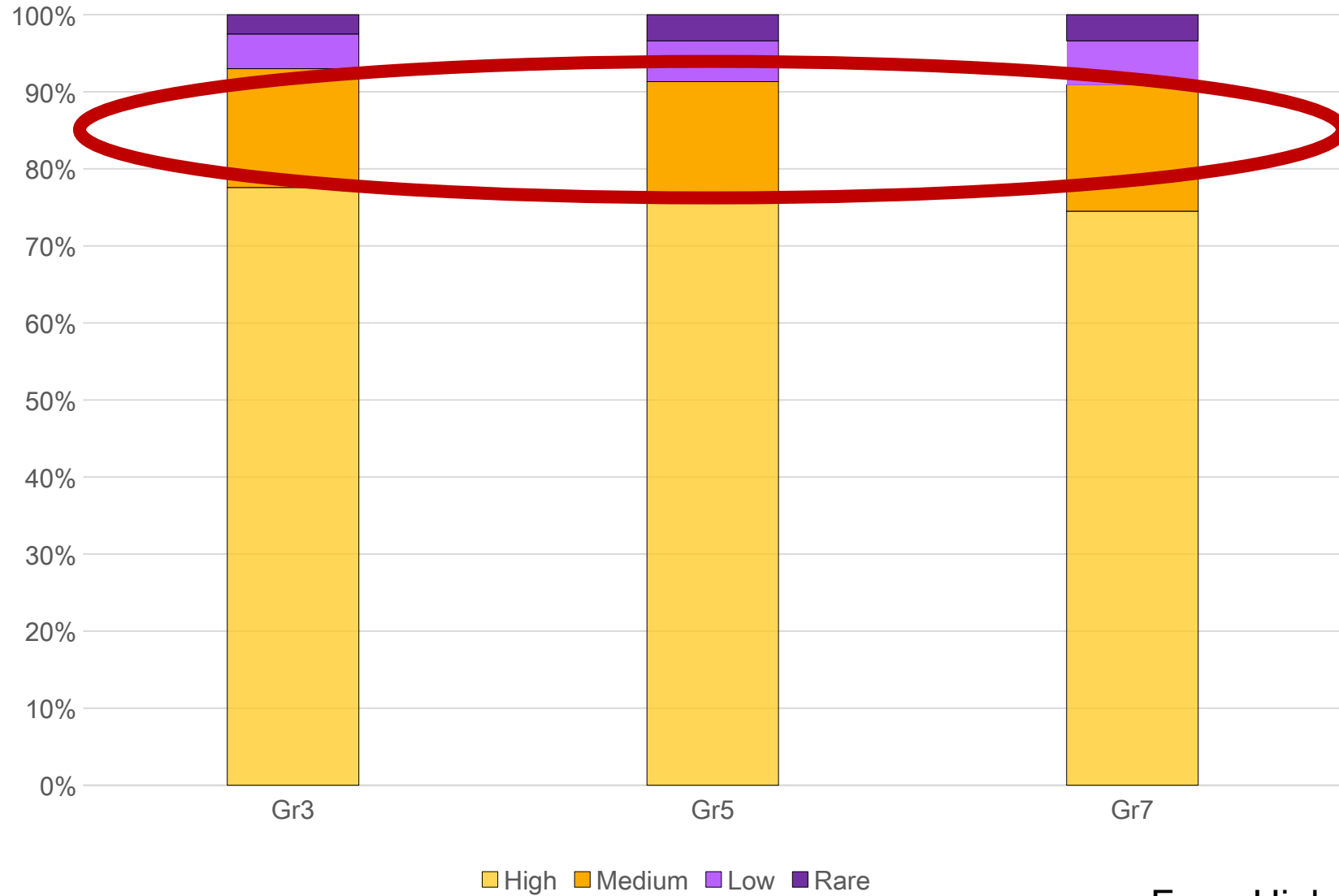


Word Distribution by Grade Levels



From Hiebert et al. 2024

Medium-Frequency Words are Critical for Automaticity



From Hiebert 2024b

Increasing Student Automaticity: TopicReads (Open-Access, Free Program at TextProject)

Table 1. TopicReads Content & Benchmarks

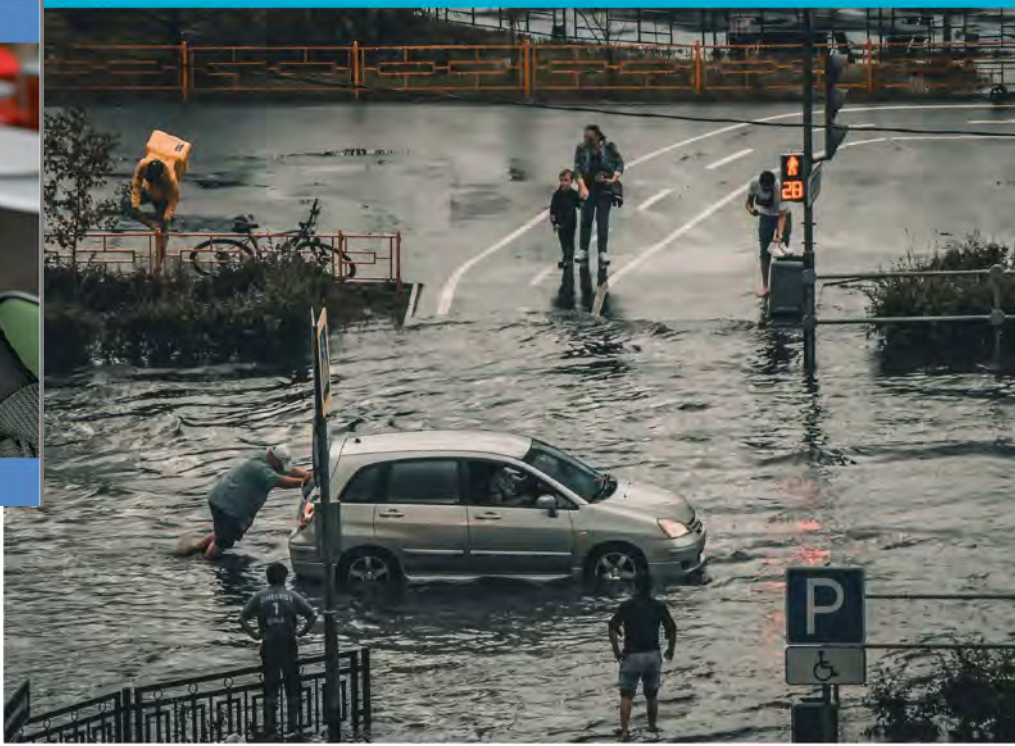
Level	TopicReads Content	Student Performance on TopicReads Benchmark
A	500 most frequently used words + single-syllable words with regular short and long vowel patterns	Reading less than 95 WCPM
B	500 most frequently used words + single-syllable words with regular short, long, and r-controlled vowel patterns	Reading from 96 to 110 WCPM
C	1,000 most frequently used words + all vowel patterns in single-syllable words	Reading from 111 to 125 WCPM
D	1,000 most frequently used words + 2-syllable words (inflected endings and compound words)	Reading from 126 to 135 WCPM
E	2,500 most frequently used words + 2-syllable words	Reading from 136 to 145 WCPM
F	2,500 most frequently used words + 2- and 3-syllable words	Reading from 146 to 155 WCPM

from TopicReads For Middle School: Instructor Guide.
<https://textproject.org/wp-content/uploads/2023/02/TopicReads-MiddleSchool-InstructorGuide.pdf>

;
 Adapted from Hasbrouck & Tindal, 2017



by Elfrieda H. Hiebert



FLOODS

Floods happen when normally dry areas are covered by water. There are several kinds of floods. Coastal floods occur near the coasts of lakes and oceans. High water from storms can cause this kind of flooding. The storm creates a storm surge, a high wall of water that surges over the land and floods it.

Floods can also occur near rivers. A river can flood from heavy rain or snow melting. Water flows into the river and over its banks. Land around the river can sometimes flood for hundreds of miles. One very dangerous kind of flood is a flash flood, which happens after intense rainfall. Flash floods happen so quickly that people cannot always escape to higher ground.

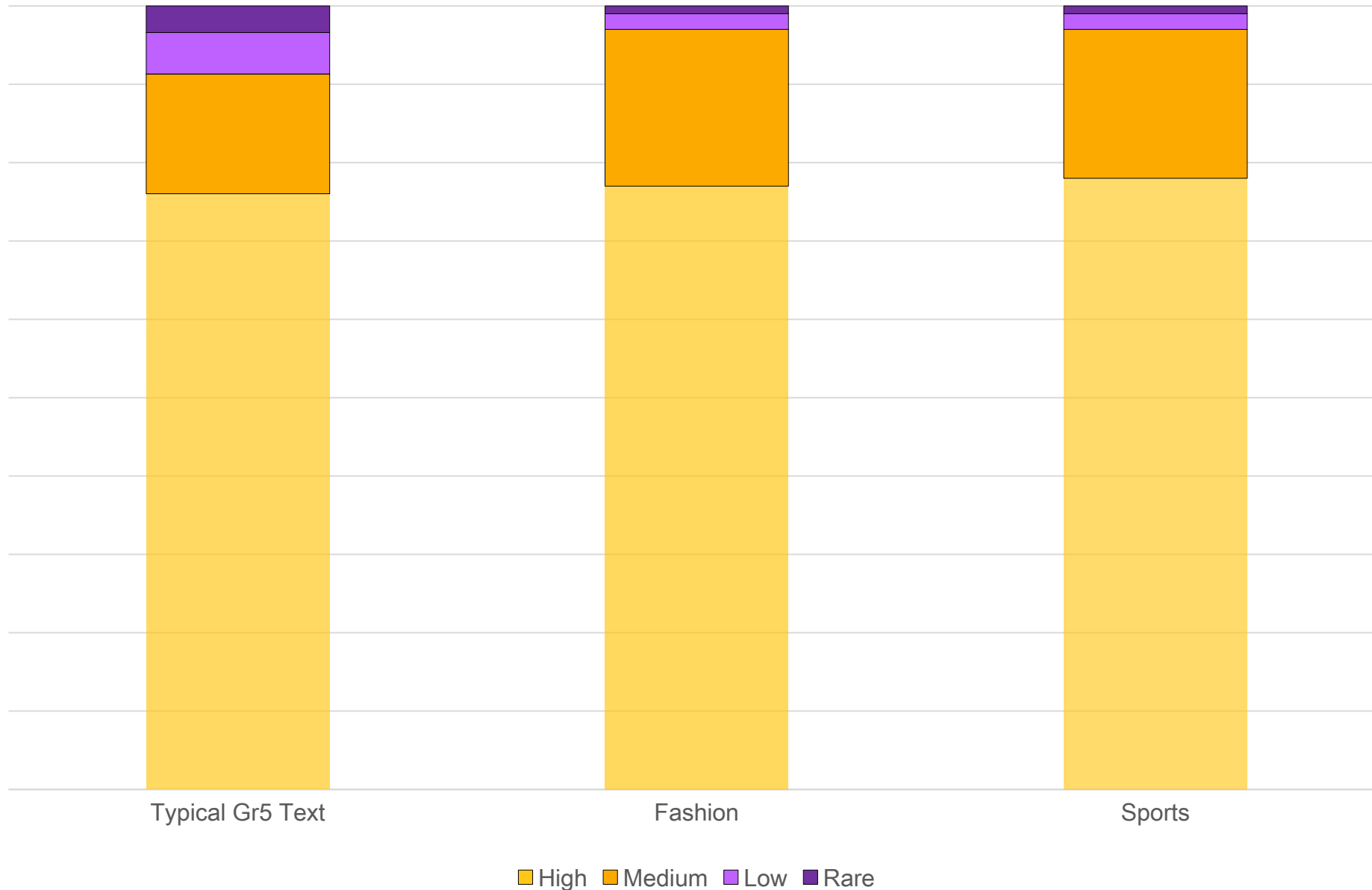
Building Comprehension

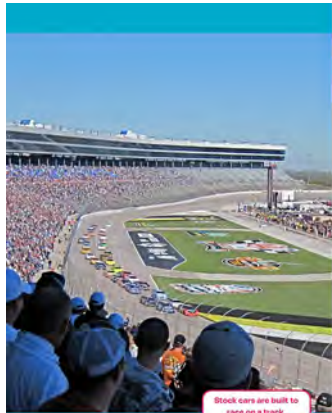
1. What can cause a coastal flood?
 - a. high water from storms
 - b. water flowing over a river's banks
 - c. melting snow
 - d. a serious flood at a riverclouds at sea

2. Why are flash floods dangerous?

From Hiebert, 2023

Supporting Automaticity in Recognizing Vocabulary: Open-Access Texts (TopicReads Level D)





Stock Car Racing

When World War II ended, U.S. manufacturers turned their attention from tanks to cars. They made fast, powerful cars, and young men found racing them.

People in different parts of the country raced different kinds of cars. In the South, people raced stock cars from a car dealer. In 1948, a racer named Bill France organized stock car racers into an association called the National Association for Stock Car Auto Racing, or NASCAR. Members raced stock cars on oval tracks.

From the time it was organized, NASCAR grew into a huge sport and a big business. Today, even though almost all the drivers and teams are in the South, millions of fans around the country watch NASCAR drivers race. These cars don't come from the dealer anymore. Instead, they're designed for one thing: going as fast as possible.

Key Notes:

What is stock car racing?

Stock cars are built to race on a track.



Streetball

It was 1988 and another hot summer in New York City. That summer, a worker for the city began street basketball tournaments. That tournament was the origin of the sport that many people play today: Streetball, as it is called, is like basketball, but it is different, too, because the origins of streetball are in the street, not the gym.

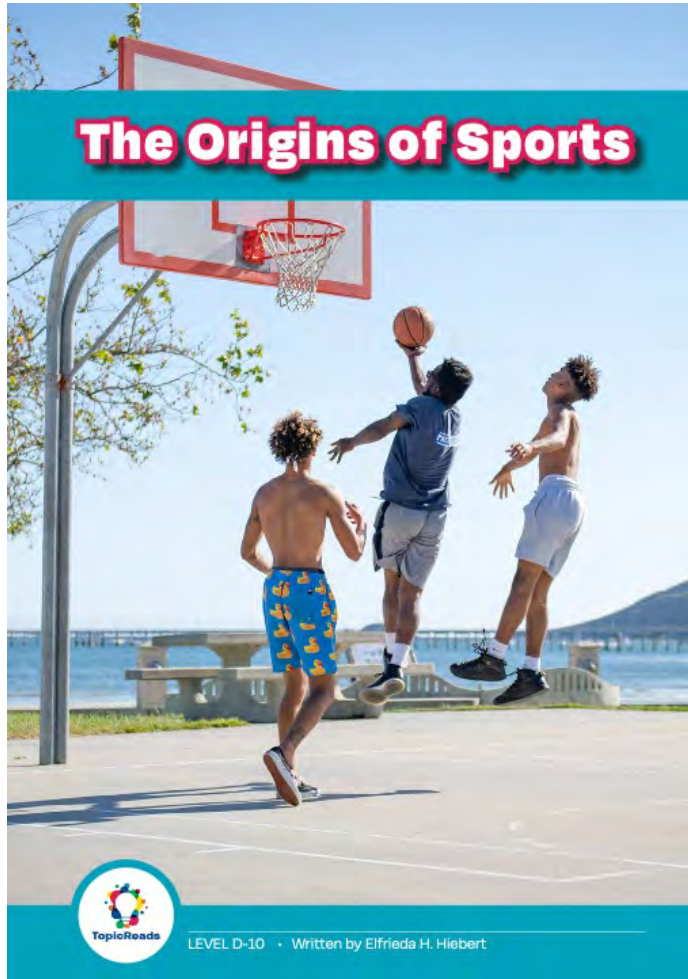
Streetball is fast, and style counts more than it does in basketball. There is no net because most baskets have no nets. In streetball, a group of people decide the rules and play. Most streetball is played without refs.

Like many games, streetball comes from a particular place. Streetball was born because New York City had basketball hoops and hand surfaces on which to bounce basketballs. New York City still has these, and streetball is still played off and on its streets.

Key Notes:

What is streetball?

Streetball, a relaxed form of basketball, began in New York City.



The Origins of Sports



LEVEL D-10 • Written by Elfrieda H. Hiebert



Double Dutch Jump Rope

Jump rope made its way across the ocean with Europeans who settled on the east coast of North America. Although many children in Europe jumped rope, Dutch children played the game in a different way.

Two children held the ends of two ropes and turned them in different directions. Another child stood within the twirling ropes, jumping over and under them. When English children saw jump rope played this way, they named it double Dutch.

The game was always common in New York City, but in the 1900's, a double Dutch craze began. Children said rhymes as they jumped to the difficult beat of the twirling ropes.

In the 1920s, the game became a sport, with teams saying rhymes as they competed to show their speed and skill. Today, double Dutch jumpers compete in meets around the world.

Key Notes:

How is double Dutch jump rope different from other kinds of rope jumping?

Rhymes and two twirling ropes are part of Double Dutch jump rope.



Snowboarding

In the snowy hills of Michigan in 1965, a father made a toy for his daughter. He put together two skis with a rope at the tip so the rider could hold the toy as it went down hills. His daughter's friends loved it, so the Michigan man made more. By 1966, more than half a million of these toys were sold.

The new sport got the name snowboarding, and soon many people were making snowboards. One was a young man who rode trays down the hills at his school. The young man started a business called Winterstick to make his snowboards. Unlike the ones first made in Michigan, these snowboards did not have a rope. Instead, snowboarders used their arms for balance.

The sport has grown. At first, many ski areas did not allow snowboarders, but not almost all do.

Key Notes:

What is snowboarding?

Snowboarders use their arms for balance.





The president of FUBU attends fashion and award shows.

LEVEL D-12, Fission

For Us, By Us

In 1992, several childhood friends from New York City decided to start a clothing company. They were entrepreneurs—people who want to start a business. They wanted to design and sell clothing for people who wanted to look good in comfortable clothing. Their clothing line was called, “For Us, By Us” (FUBU). Today, FUBU helps set the style for hip-hop urban wear.

The first products the company made were hats. Then, it added shirts. The entrepreneurs recognized hip-hop stars to wear FUBU clothing. They felt that big companies did not respect the urban market. FUBU understood that many people wanted to be part of the world, and the company’s clothing soon became popular.

At first, no big stores wanted FUBU’s clothes, but they sold well in small stores. Today, FUBU clothing is available in stores big and small all over the world.

Key Notes:

Why did FUBU choose that name for the company?

This fashion designer is sketching his designs.

LEVEL D-12, Fusion

The Fashion Designer

The figure in the fashion world that people hear about is the designer. People with this career decide the shape and look of clothing most of us wear.

First, a designer uses his or her imagination to come up with ideas for clothing designs. Ideas come from many places such as from the clothing of other countries and costumes in movies. Once the designer has an idea, he or she sketches the design for a piece of clothing.

The next step is for the designer to turn that sketch into the pattern from which the clothing can be made. Then, people whose career is sewing use the pattern to cut pieces of fabric and sew them into clothing. Finally, the clothing is ready to go to stores, where buyers finally see the result of the designer’s imagination.

Key Notes:

What does a fashion designer do?



LEVEL D-12 • Written by Elfrieda H. Hiebert



LEVEL D-12, Fusion

Where Fashion Comes From

Fashion designers get their ideas for new fashions from all over the world. In earlier centuries, for example, American designers copied the latest fashions from Paris. Today, designers find ideas in other countries like Japan.

One example of the worldwide trading of fashion ideas today is the influence of African style on designers from other parts of the world. Designers from around the world use African cloth in their designs because they love its bold colors and patterns. Some designers have copied traditional African draped clothing, including wrap skirts, and have designed jewelry that is influenced by African style.

Another example of the trading of fashion ideas is the influence of the Japanese kimono in the world of designers from Europe and the United States. Versions of the loose, flowing kimono can be seen in high-fashion clothing designed today.

Key Notes:

Where does fashion come from?



LEVEL D-12, Fusion

What is Fashion?

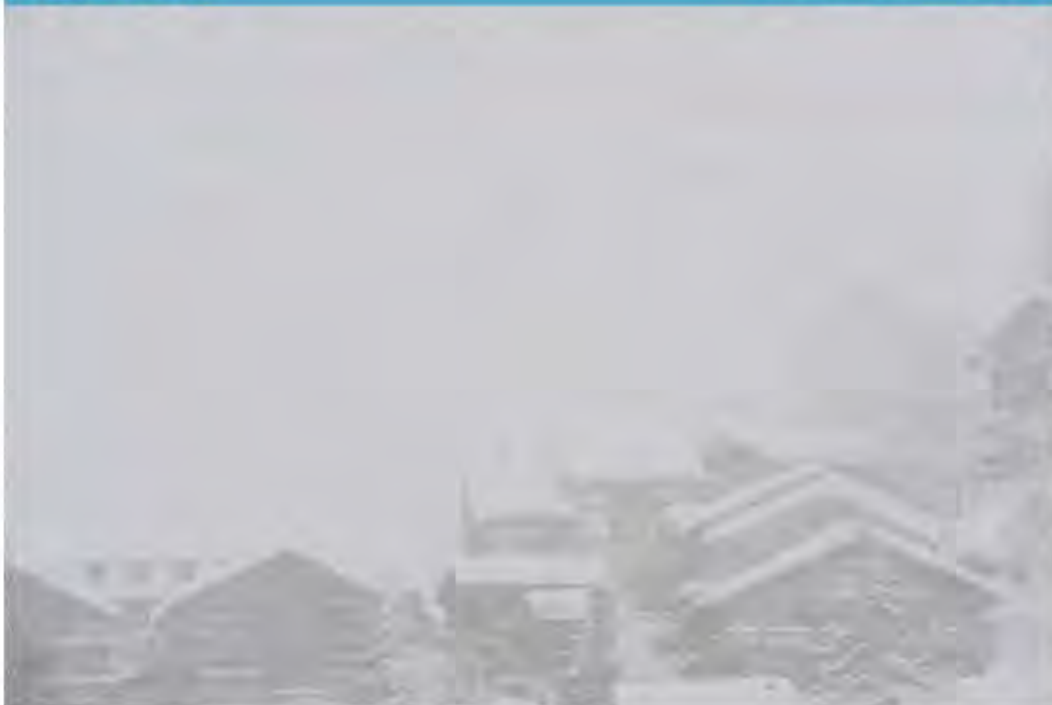
Fashion is a popular style of clothing. The clothing that’s fashionable changes, though. Every year, designers sketch new clothing designs. Stores decide which designers’ clothes people might like. Then, people go out and buy what has become the latest style.

One example of how fashion catches on is the story of the T-shirt. It began in fashion as an undershirt for men in Europe. United States soldiers saw the comfortable shirts during World War I. T-shirts caught on as men’s underwear in the United States.

By the 1950’s, men were wearing T-shirts on the outside instead of as underwear. Movie stars started wearing them. Today, many people wear T-shirts. Sometimes the shirts have words that tell about those wearing them. Many fans of sports teams might wear shirts that tell which teams are those persons’ favorite.

Key Notes:

How did the T-shirt come into fashion?



BLIZZARDS

Blizzards are serious winter storms with snow. In a blizzard, snow comes with strong winds of 35 miles per hour or more. The temperature is usually 20 degrees below freezing or lower. Because the wind is blowing, people can see less than a quarter of a mile. Sometimes, a blizzard is so strong that people can only see a few feet ahead. Blizzards with that kind of wind are called whiteouts.


Blizzards cause dangerous conditions. People in cars may be stranded on roads. Those who are outside may not be able to tell where they are. People can suffer frostbite. They may even die from exposure to the cold. When blizzards occur, the best advice is to stay indoors



Building Comprehension

1. Which best tells what a blizzard is?
 - a. when the temperature is below 20 degrees, and the wind is blowing
 - b. a windy snowstorm with temperatures 20 degrees below freezing or lower
 - c. a snowy storm when winds are 20 miles an hour or more
 - d. a storm with snow that blows a quarter of a mile or more

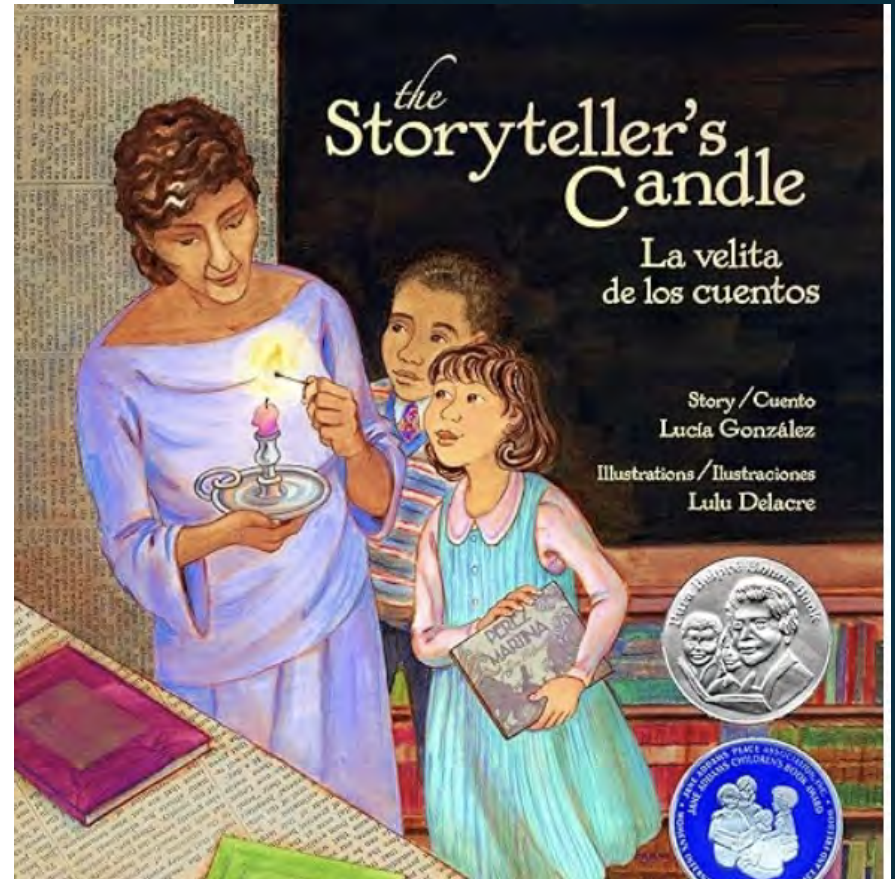
2. What is the best advice for living through a blizzard?



2. Using AI to Select Specific Words & Texts

Using Findings from Research on Word Features to Select the Words to Teach: An Alternative to Cherry Picking Vocabulary

- slender
- gallant
- chimed
- preparations
- flickered
- concluded



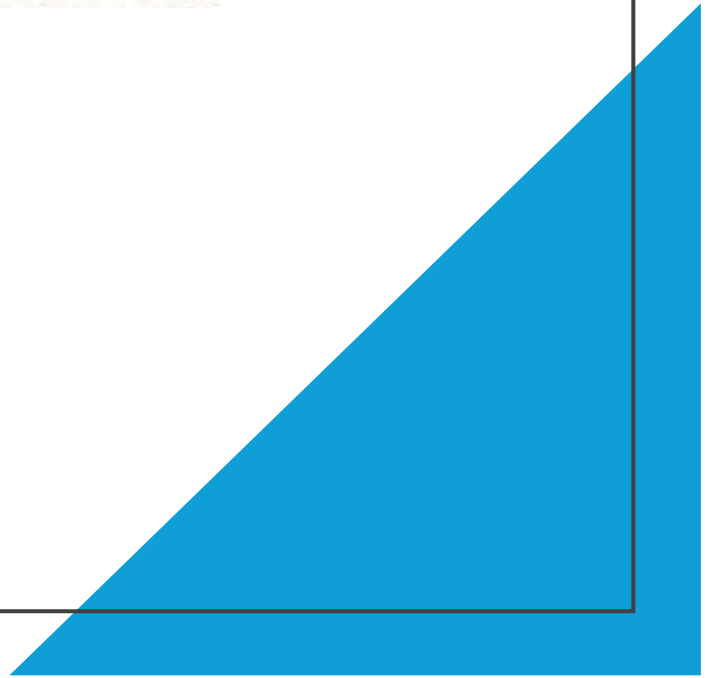
Support from AI: Questions & Specifications

FH: Claude, I'm a third-grade teacher. Many of my students are not at the level of vocabulary required for strong comprehension. I'm working with a story entitled *The Storyteller's Candle*. The story is about a librarian creating a celebration for an immigrant community on an important holiday. I've picked out some of the words in the story that may be challenging for my students.

Can you help me in identifying **which of these words are ones that may be challenging** for students but **are also words that will extend beyond third grade and support their reading in the middle grades and beyond:** announcement, parade, chimed, characters, costumes, applause, gallant, fiesta, preparations, event, rehearsed, donations, celebrated, decorations. **I also want to help my students' background knowledge on the topic of what is part of a performance like a play.**

- "slender" - Limited academic utility, mainly descriptive
- "gallant" - Literary word but limited modern use
- "chimed" - Specific to sound, limited academic use
- "preparations" - ✓ HIGH VALUE - used across subjects and contexts
- "flickered" - Specific to light/movement, limited academic use
- "concluded" - ✓ HIGH VALUE - important for academic writing and reading

Target Words



1. "announcement" - ✓ HIGH VALUE - formal communication across contexts
2. "event" - ✓ HIGH VALUE - used across all subjects
3. "preparations" - ✓ HIGH VALUE (overlaps with publisher list)
4. "celebrated" - ✓ HIGH VALUE - cultural and historical contexts
5. "donations" - ✓ HIGH VALUE - civic and social studies contexts

Valuable Words for Long-Term Academic Success



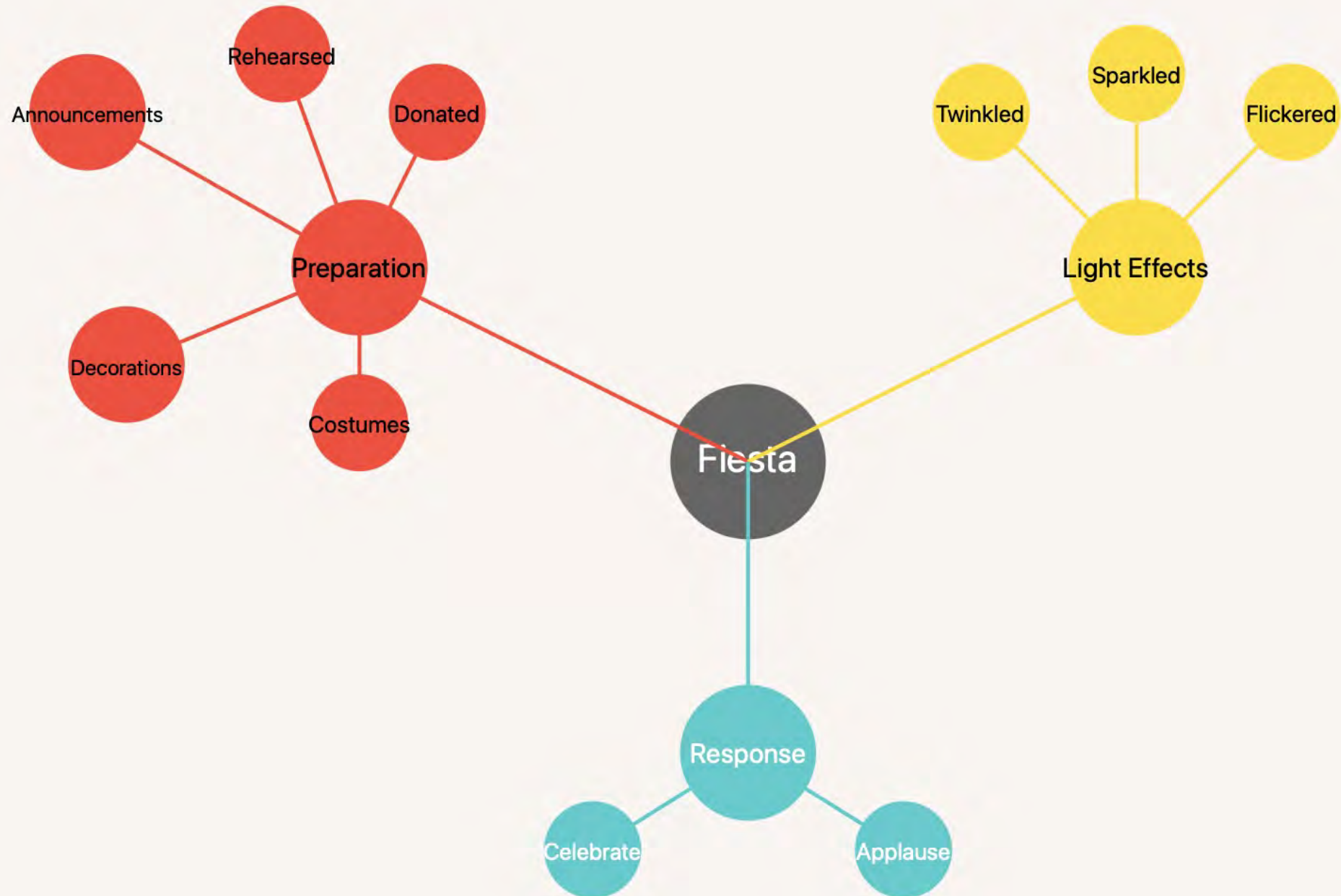
1. "rehearsed" - Understanding performance preparation
2. "characters" - Understanding story elements and roles
3. "costumes" - Understanding visual representation
4. "applause" - Understanding audience participation
5. "decorations" - Understanding setting creation

Words Related to Performance

1. "fiesta" - Understanding cultural celebrations
2. "celebrated" - Understanding commemoration
3. "event" - Understanding organized gatherings

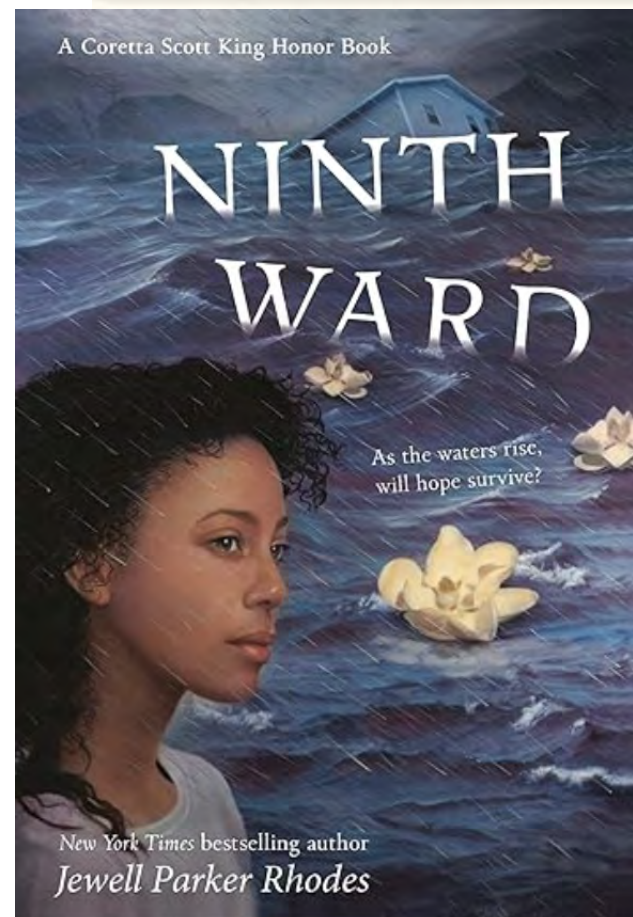
Building Background

AI's Graphic Representation of the Vocabulary



As texts become more
complex, key
vocabulary may need
to be inferred

What are the most critical words that describe the underlying themes of these chapters of Ninth Ward?



1. **Fortitude** - Explicitly defined in the text as "strength to endure" and repeated as a mantra by the characters
2. **Resilience** - Demonstrated through Lanesha's ability to adapt and overcome increasingly difficult challenges
3. **Self-reliance** - Shown when Lanesha states, "Me and TaShon have rescued ourselves"
4. **Hope** - Maintained even in dire circumstances ("We're going to be fine")
5. **Connection** - Between the living and dead, between friends, forming bonds that provide strength
6. **Transformation** - "I've been born to a new life" reflects Lanesha's internal change
7. **Ingenuity** - Using mathematics and problem-solving to overcome obstacles
8. **Perseverance** - Continuing despite exhaustion, hunger, and despair
9. **Identity** - Lanesha affirming who she is at the end: "I'm Lanesha. Born with a caul. Interpreter of symbols and signs."
10. **Faith** - Belief that they will survive even when evidence suggests otherwise

Here are the phrases or sentences from the text that demonstrate the key thematic ideas:

1. Fortitude (explicitly stated):

- "TaShon lifts his head and wipes his eyes. He looks far off... Then, he says softly, 'Fortitude.'"
- "'Strength to endure.'"
- "'That's right. We're going to show fortitude.'"
- "I know we are both thinking, murmuring in our minds, over and over again, 'Fortitude. Fortitude. Fortitude.'"

2. Hope (explicitly mentioned):

- "I tell TaShon a hundred different Bible stories all about hope."

3. Identity (explicitly stated):

- "I'm Lanesha. Born with a caul. Interpreter of symbols and signs. Future engineer. Shining love."
- "I'm Lanesha. I'm Mama Ya Ya's girl."

4. Resilience (demonstrated):

- "I've been born to a new life. I don't know what's going to happen to me. I just know I'm going to be all right."
- "I'm not scared. I think this in a blink of a butterfly's eye."

5. Self-reliance (demonstrated):

- "Inside, I feel good. Me and TaShon have rescued ourselves."
- "'We made it out of the attic, didn't we, Lanesha?' ... 'Yes, we did,' I say. 'We made it out.'"

6. Connection (demonstrated):

- "Together, they both say, 'We love you,' and I feel such peace coming over me."
- "Both my mothers are fading. Then, gone. Yet not. They'll always be together and always be with me."
- "I say, we're going to be best friends forever."

7. Transformation (demonstrated):

- "I've been born to a new life."
- "I should've known better. Should've known that there was more to see about TaShon than he ever let show. He's a butterfly, too."

8. Ingenuity (demonstrated):

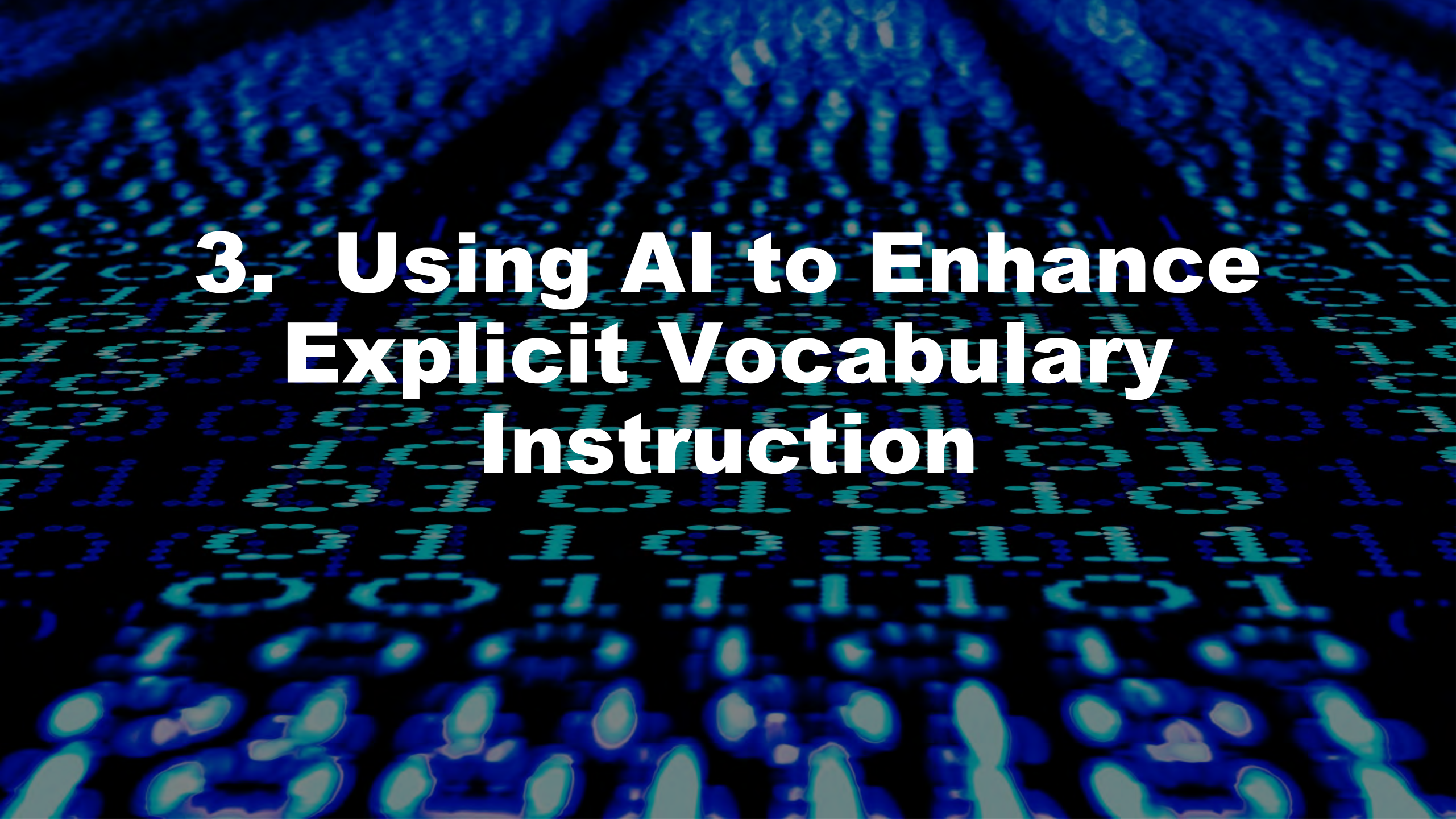
- "EVERYTHING IS MATH. Think, Lanesha."
- "It's like playing pool. See. The boat is stuck; if we can knock it free, it'll float right past us."

9. Perseverance (demonstrated):

- "I am strong. Not scared. I think this in a blink of a butterfly's eye."
- "Thirsty, sore, sunburned, blisters bubbling on our hands, laughing, me and TaShon are having fun."
- "We keep pace together. Us both rowing, stretching our backs, our legs. Pushing against the current with all the strength we've got."

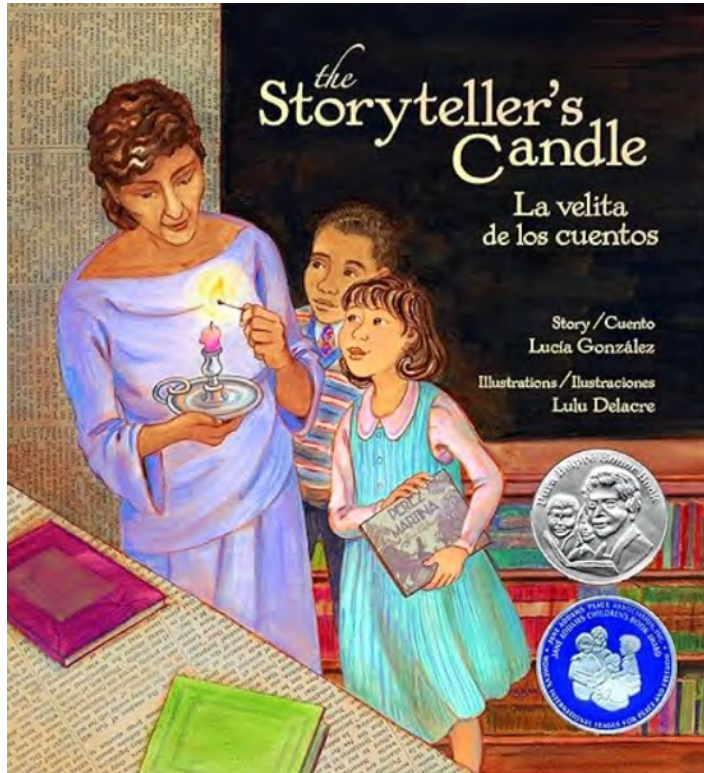
10. Faith (demonstrated):

- "Mama Ya Ya says we're going to be fine, TaShon."
- "'Someone's coming,' I insist. 'People know we're here.'"



3. Using AI to Enhance Explicit Vocabulary Instruction

Additional Opportunities with Story Vocabulary (*The Storyteller's Candle*)



	Original Text (Storyteller's Candle)
announcement	2
applause	1
celebrated	1
costumes	2
decorations	1
donated	1
fiesta	2
preparations	3
rehearsed	1

Activity 1: Generating Additional Texts with Target Vocabulary

FH Can you write a story about third graders putting on a play? Include the words applause, rehearsed, decorations, announcements, and costumes--repeating these words or morphological family members (e.g., applause, applaud; rehearse, rehearsal) at least two times each. The text is intended for third grade students who are not the greatest readers. Can you make the text at least 450 words and make it engaging so that an unmotivated student will want to reread it.



The third graders wore animal costumes for their big show.

The Dancing Zoo Animals

Today was an exciting day for me at school. Our third-grade class put on the play “The Dancing Zoo Animals.” For two weeks, we had daily rehearsals to learn our parts for the play. Mrs. Cooper, our teacher, made an announcement before the play began: “Remember, we’ve rehearsed this many times. You are all well prepared for the performance!”

But all of us were too busy looking at one another’s costumes to be worried. Jake had the part of an elephant and his costume was gray with big floppy ears. My penguin costume was black with a very big white bowtie. Sofie’s costume was the tallest of all. That’s because she was a giraffe.

We had all helped make the decorations for the play. The stage on the gym was filled with paper trees and big boxes. We had painted them to look like rocks. We had also strung up lights which made the decorations sparkle.

Finally, the gym was full of our families and friends. The music started. We all danced out onto the stage just like we had practiced in rehearsals.

Jake's elephant trunk made everyone laugh as he pretended to spray water at the audience. When Sofia the giraffe pretended to eat leaves from the paper trees, all the visitors laughed again. My favorite part was when I and the other four penguins waddled in a line and then did a slide move that we had rehearsed.

At the end of the show, everyone in the audience applauded. Some people in the audience even stood up to give us more applause! Mrs. Cooper made one last announcement: "You were great in rehearsals but your performance this afternoon was even greater."

After the show, we had cookies and juice in our classroom. We were getting hot inside our costumes. But no one wanted to take off their costumes. We were enjoying the celebration of our success!



FH Can you write a text (informational text) for third graders who aren't the most proficient or motivated of readers? The text should be about tasks involved in putting on a school performance for families and friends. I want these words included in the text: announcement, decorations, preparations, donated, costumes, celebrated, applause. I want each of these words (or a member of their morphological family) to be repeated. The informational text should be about 375 words long.



• Click to add text

Our School Show

Getting ready for a school show takes lots of work! First, we need to make an announcement. This tells families when and where the show will be. We make colorful posters to hang up all around school.

Before the show, we need decorations. These make the stage look special. Some students paint on big paper to hang on the walls. Others make smaller pieces for the tables where the audience will sit.

The preparations take time. Some students help get the stage ready. Others work on the music and lights that the audience will see and hear.

We have to rehearse many times. Each rehearsal helps us remember our parts better. Teachers watch us rehearse and give helpful tips.

Many things are donated for our show. Parents bring snacks for everyone to enjoy. A local store also gives paper for our programs that the audience will read.

We rehearse the play many times.



The sound is loud when we take our final bow to the audience.

Some costumes are simple, like adding a hat or scarf. Others need more work. Everyone helps make or find costume pieces that will look good to the audience.

The day of the show is exciting! All our hard work is celebrated when families arrive. After each act, the audience claps. This makes performers feel proud.

The best part is the applause! When people clap, it means they liked our show. The sound is loud when we take our final bow to the audience.

After the show, we announce the names of everyone who helped. We take down the decorations carefully. The donated items are put away or returned.

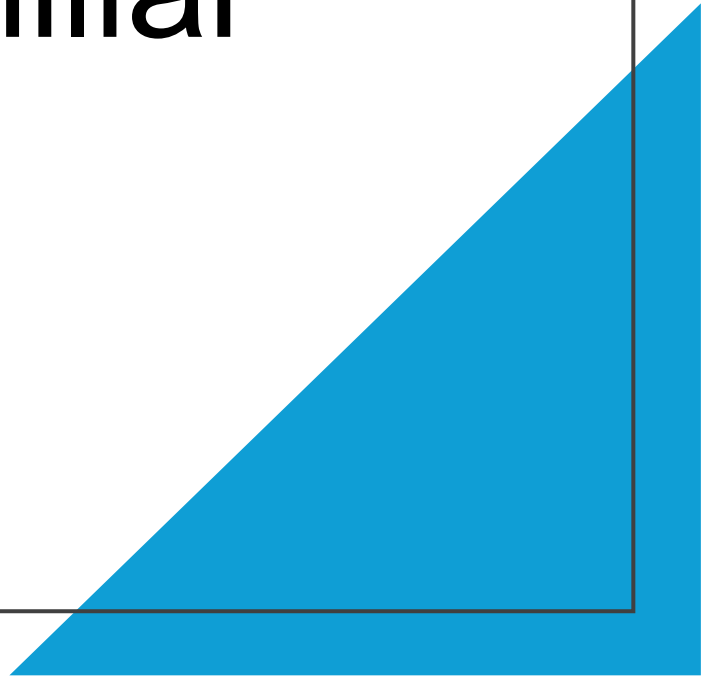
Our rehearsals paid off! All those times we practiced made the show great. Next time, we will know how to rehearse even better for our audience.

Getting ready for a show takes teamwork! From the first announcement to the final applause, every step matters. All the hard work is celebrated when we see happy faces in the audience!

Repetition of Vocabulary in Texts

	Original Text (Storyteller's Candle)	Dancing Animals	Our School Show	Total Repetitions
announcement	2	2	3	7
applause	1	2	3	6
celebrated	1	1	2	4
costumes	2	6	3	11
decorations	1	2	2	5
donated	1	1	2	4
fiesta	2			
preparations	3	3	2	8
rehearsed	1	5	3	8
audience			6	

**Activity 1b: Create illustrated
descriptions of less familiar
concrete words**

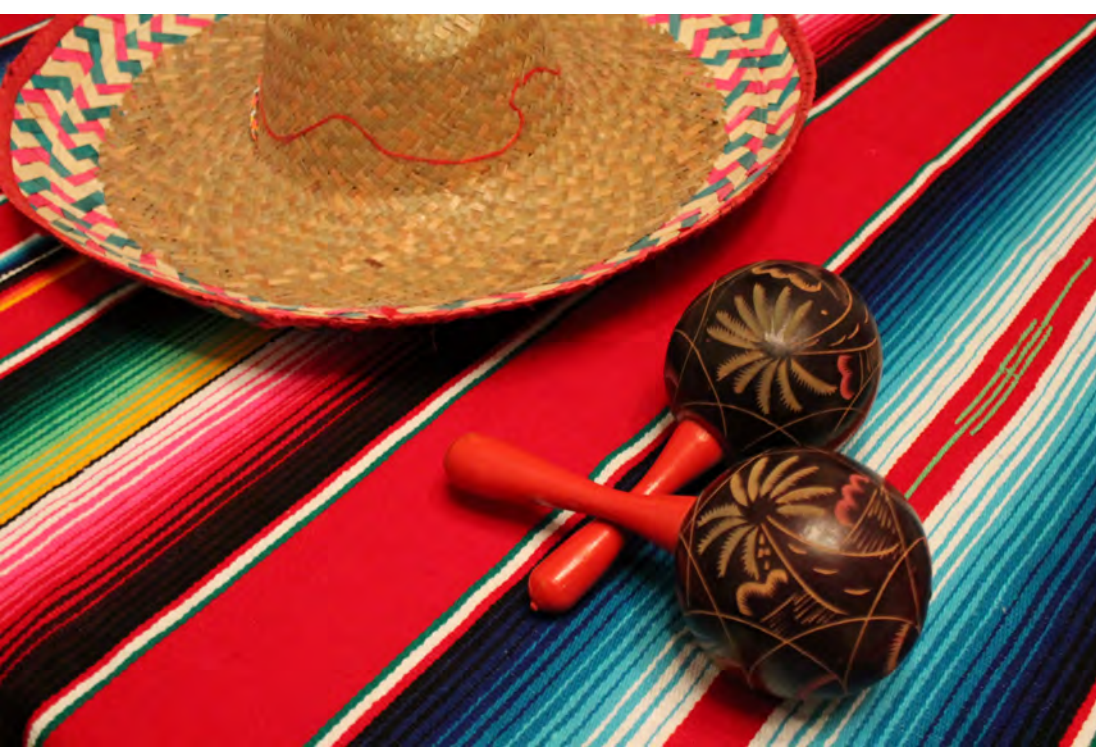




Bodega is a Spanish word for a corner store or small grocery store. Spanish-speaking people brought this word to U.S. cities. They used the word bodega for the small stores they opened in their neighborhoods.

Today, many people say bodega even when speaking English. These stores are special places in neighborhoods, a place where neighbors meet and talk with each other.





Maracas are musical instruments you can shake to make music. They look like small rattles with handles. Maracas come in pairs, one for each hand. They are hollow inside and filled with small beads, seeds, or tiny pebbles.

Maracas come in bright colors and sizes. Some are made from dried gourds (like hard vegetables), while others are made of plastic or wood.

When you shake maracas, the things inside hit against the walls making a "chiki-chiki" sound. In many songs, maracas help make the music feel happy and bouncy. You can shake them fast or slow to make different rhythms.





ID 52304185 © Lailoken123 | Dreamstime.com

A **crate** is a big box used to carry or store things. Crates are usually made of wood, unlike cardboard boxes. They have slats (thin pieces of wood) with small gaps between them.

Some crates carry fruits like apples and oranges. Others hold bottles or tools.

Crates can be stacked on top of each other. This makes them good for moving lots of things at once.



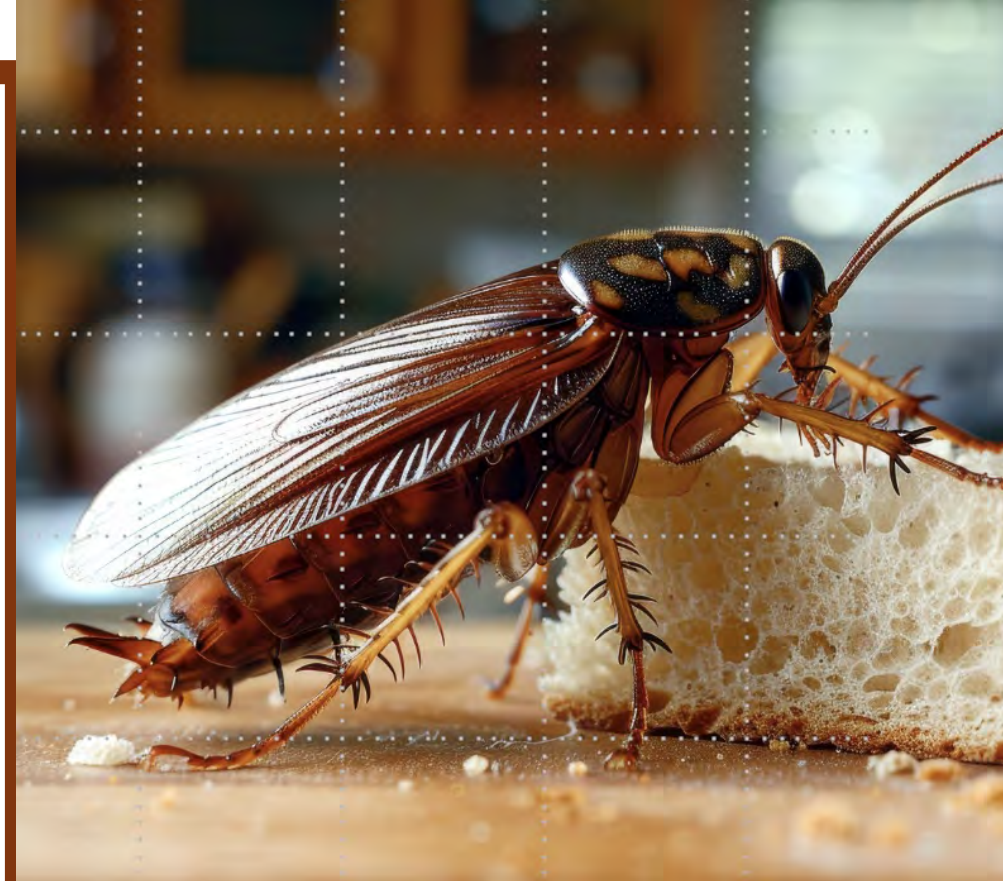
ID 83527942 © Nordroden | Dreamstime.com



A **cockroach** is a small bug with a flat, oval body. It has six long legs. And two long antennae (like feelers) on their heads. These help them find food and move around in the dark. Their bodies are usually brown or black and shiny.

Cockroaches like warm, dark places. They come out mostly at night to look for food.

In real life, cockroaches are not clean bugs. But in stories from Puerto Rico and other Spanish-speaking countries, cockroaches like Martina are turned into fancy characters. Story cockroaches wear pretty dresses and keep clean houses. These story cockroach characters teach about kindness.



6814759 Sanclemenedigpro Dreamstime.com

Activity 2: Generating Semantic Grids

FH Can you make a semantic grid with the words flickering, sparkled, twinkle and 5 other words that have varied degrees of intensity in the same semantic category. Can you ensure that 2 of the new words are ones that students who are not great third-grade readers can read?

FH Can you list the words with the most intense (blaze) at the top of the list and make the words in different colors (against a black background)--the most intense word in red.

blaze

flash

sparkled

gleam

flickering

shine

twinkle

glow

FH

Now can you make a semantic grid for words in the semantic family of the word announce. I want 7 words, 3 of which are ones that struggling third-grade readers can read.

shout*

proclaim

broadcast

announce

notify

tell*

say*

Activity 2b: Adding Morphological Families to Semantic Families

FH

Can you make a mind map of all of the morphological relatives for the word announcements.

announce

Verb Forms

announces
announced
announcing

Noun Forms

announcer
announcers
announcement
announcements

Re- Forms

reannounce
reannounced
reannouncing
reannouncement

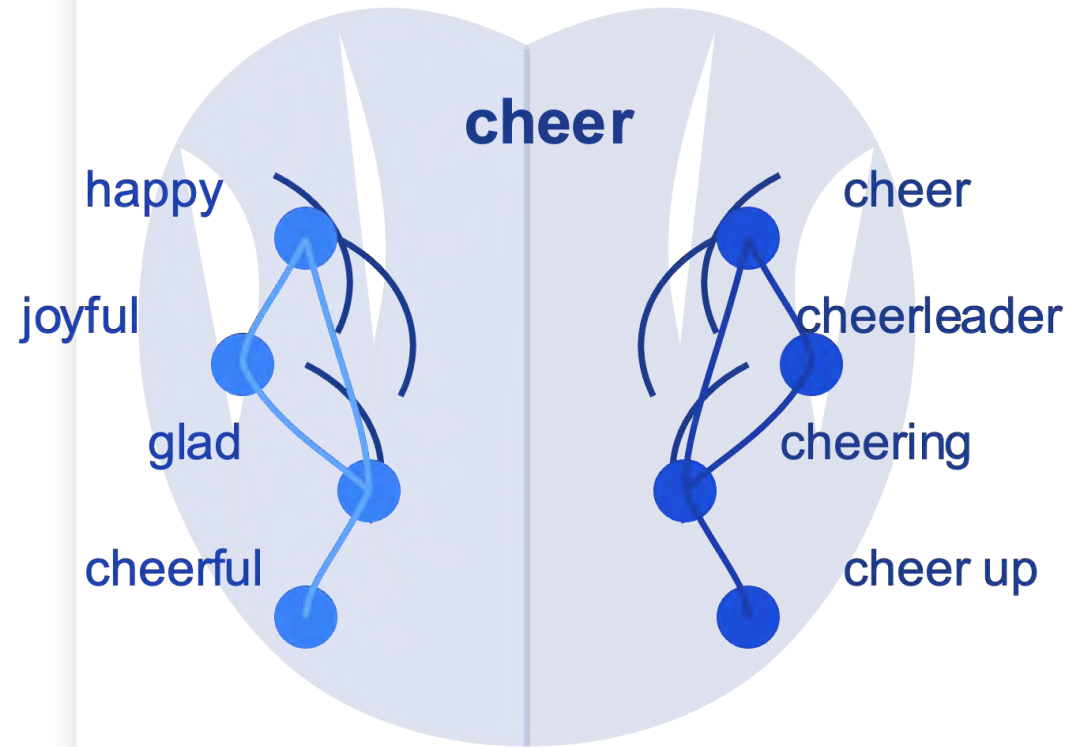
Pre- Forms

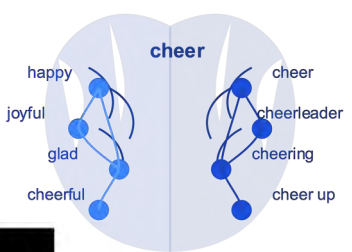
preannounce
preannounced
preannouncing
preannouncement

Un- Form

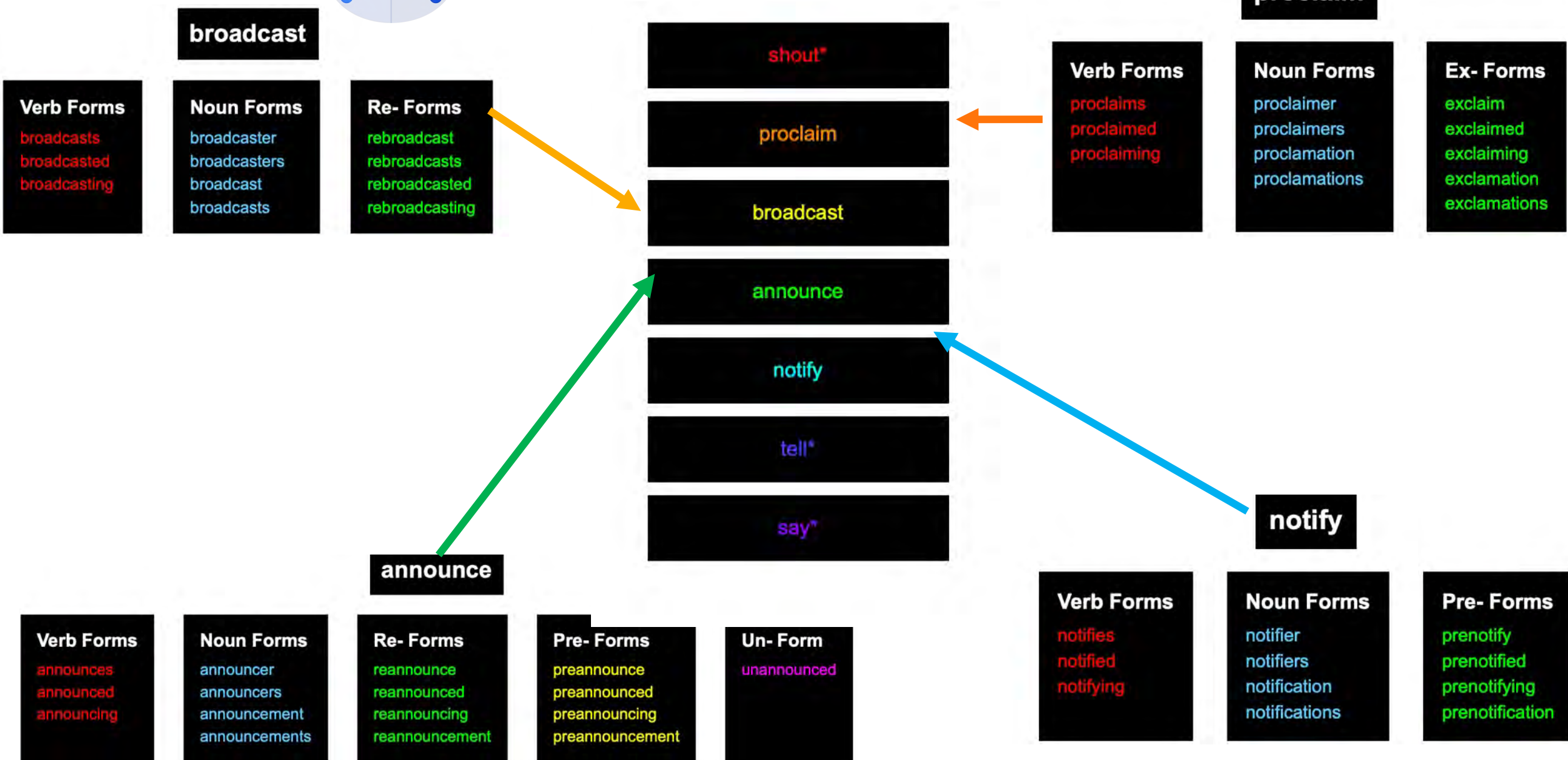
unannounced

My Neural Neighborhood S





My Neural Neighborhood: *The Storyteller's Candle*



Activity 3: Assessing Students' Vocabulary and Automaticity

Maze Assessments

FH Can you write a passage for use in a maze assessment for third graders. The target students are not highly proficient readers so I would like all of the words, other than the target words (announce, applause, celebrate, costume, decorations, donated, preparations, rehearsed) to be ones that the students can likely read with automaticity. If you can please repeat at least some of the words--they can also be relatives of the target words. The text should be 375 words long.

FH Now can you make this into a maze assessment: First and last sentences remain in tact. Beginning with the second sentence, every 7th word is left blank, followed by parenthesis in which the target word and two distractors appear. Distractors should be the same length in letters and should be the same grammatical form. Don't make any of the distractors silly. Please randomize the placement of target words in relation to distractors. Can you ensure that distractors are not exceptionally rare or challenging words to read.

The School Play

The school play was coming soon! Every day after lunch, the ___ (crew, kids, staff) in Mrs. Smith's class rehearsed their ___ (books, songs, lines). Tom's dad donated snacks for ___ (everyone, nowhere, outside), and Zoe's mom helped make ___ (not, the, far) decorations for the stage. When ___ (new, old, the) big night came, all the ___ (students, writers, farmers) wore their costumes.

The principal ___ (took, made, kept) an announcement before the show ___ (walked, jumped, started): "Welcome to our winter ___ (test, play, game)!" The children acted out ___ (your, some, their) parts perfectly. At the end, ___ (one, the, few) crowd gave them loud applause.

___ (Since, After, Until) the show, the whole class ___ (searched, wandered, celebrated) with cookies and juice. Everyone agreed it ___ (felt, was, ran) the best play ever!

Target Vocabulary

fiesta

applause

donated

rehearsed

celebrated

costumes

decorations

announcement

1. Tom _____ his old books to kids who needed them at school.
2. The class _____ their songs every day until they knew all the words.
3. At the _____, there were fun games and lots of good food to eat.
4. The crowd gave loud _____ when the little dog did its trick.
5. We put up birthday _____ like balloons and streamers all over the house.
6. The teacher made an _____ about the field trip next week.
7. The kids put on their Halloween _____ and went to get candy.
8. We _____ with cake and ice cream when my team won the game.

Morphological Family Members

Fill in the blank with the correct word.

Words to choose from:

announced	announcement	announced
announces	announcer	unannounced

1. The baseball _____ spoke clearly into the microphone.
2. The principal made an _____ about the pizza party.
3. My cousin made an _____ visit with her new puppy.
4. The teacher _____ the winner of the art contest every Friday.
5. Mom _____ that we could get ice cream after dinner.
6. The student is _____ the weekly lunch menu over the speakers.

Semantic Family Members

Fill in the blank with the best word.

Words to choose from:

broadcast	notify	announce	shout
proclaim	say	tell	

1. The TV station will _____ the football game live across the country.
2. The school will _____ parents by email if there is a snow day.
3. The principal will _____ important news over the speakers about the fire drill.
4. The coach had to _____ instructions to the players during the noisy game.
5. The king will _____ his daughter as the new ruler of the kingdom.
6. Can you _____ your name clearly when it's your turn?
7. I need to _____ you something important about the class party.

Potential Problems

:

AI for Vocabulary Instruction

Generating text with consideration of vocabulary requires clarity of curriculum and developmental progression.

“The lowest hanging fruit”: An even larger world of worksheets; fewer opportunities to deal with complex texts.

Knowledge is the commodity of the digital age. Fatuous texts and worksheets can be a barrier to knowledge acquisition as well as a deterrent to motivation and learning.

AI Generated

Snow Art

Snow falls soft and white. It lands on trees and roofs. Look at the snowflakes on your glove. Each one is a little star!

You can cut paper to make snowflakes. Fold the paper and snip small bits. Open it to see your star shape!

You can also draw a snowy day. Use a white crayon on blue paper. Add a big snowman. Does your snowman wear a hat? Snow is cold, but your art is warm and fun!



AI Assisted

Level 2: Art in Weather



The Patterns of Snowflakes

If you live in or visit a place where it snows, you can try to catch a snowflake. You need to do this very fast because snowflakes melt quickly from the heat of your hand.

Snowflakes are too little for you to see their patterns with just your eyes. You need a big glass lens to see the snowflakes. Through the lens, you will see that each snowflake has its own pattern. Some look like the lace on a party dress. Some snowflakes have thin lines that branch out like trees. No two snowflakes look the same, but they all have six sides.

Make Your Own Snowflakes

- Take a sheet of white paper and fold it in half and then fold it in half two times more.
- Now cut small shapes along the sides.
- When you open your paper, you'll find a snowflake with six sides.



A sheet of paper that is folded three times can be cut to make a snowflake.

Weather in Art



Vocabulary Automaticity Using Linked Text
Level 2: Art in Weather

Level 2: Art in Weather



Cloud Pictures in the Sky

Look up at the clouds floating in the bright blue sky. Sometimes clouds seem to make a picture as they float by. A cloud might make you think of a rabbit with long ears, a fish with fins moving back and forth, or a dragon with wings spread wide. Even tiny clouds can look like something special, like boats sailing across the blue sea. Huge clouds can look like giant ice cream cones, reaching to the top of the sky.



Make Your Own Cloud Art

- You can create your own cloud shapes. Start with blue paper for the sky. Use cotton balls for puffy clouds. Pull the cotton balls apart to make long, streaky clouds or stack them up for tall tower clouds.
- You can also paint cloud shapes with white paint and a sponge. For wispy clouds, tear white paper into long, thin shapes.

Caption

8

Level 2: Art in Weather



Rain Patterns

Look out a window when it rains. Drops of rain fall on the window. Each drop starts small and round. Some drops seem to race each other down the glass. When they meet, the drops join and slide down the window together.

When you are outside in the rain, watch as a puddle of water forms. When a drop of rain hits the puddle, it makes rings in the water. The rings get big and fade away. More drops make more rings and the puddle gets bigger.



Make Your Own Rain Art

- You can make a picture that looks like rain. First, put on an old shirt so you do not get paint on you.
- Get blue paper, white paint, a big brush, and water. Mix the white paint with water to make it runny.
- Hold your brush high over the paper. Let the paint drip down.
- Some drops of paint will run fast, some slow. Some drops will meet and mix up. Your rain painting looks just like the rain outside.

Caption

10

Level 2: Art in Weather



Look at the Wind!

Wind is air that moves. When air flows fast or slow, we call it wind. This moving air can push and pull things, like the leaves and branches on trees. The wind can send leaves falling from trees. Wind can make the tops of tall trees bend left and right. When the wind gets strong, flags can snap in the air.

Make Your Own Wind Art

- You can make a picture that shows the way in which the wind moves. First, put some black paint in the middle of a page.
- Next, get a straw. Now blow through the straw at the paint. The paint will run across the page, just like the wind in the trees.
- Tip the page up or down to make the paint flow. Blow soft and blow hard to see what the wind can do.
- When you are done, you will have art that looks just like the wind's path.

Caption

Nicole Tagliavini | Dreamstime

Level 2: Art in Weather



Light Makes Rainbows

Watch what happens when the sun shines through a glass of water. All the colors of the rainbow seem to dance on the wall. You can see red, orange, yellow, green, blue, and purple.

On a hot day, you might see spots of color in the water as you spray plants with a hose. When it rains, water drops in the sky can split sunlight into a big rainbow. Even the light through your window can make tiny rainbows on the floor when it shines through a vase or a glass cup.

Make Your Own Rainbows

- You can make a rainbow with a glass of water, a mirror, and a flashlight in a dark room. The mirror goes inside the glass of water. The mirror needs to be on its side facing out.
- Put the glass of water with the mirror on a table. Turn out the lights. Make sure no light is coming through the windows.
- Now turn on the flashlight and shine it through the side of the glass toward the mirror. If you put your hands on the table beside the glass, a rainbow will cover your hands.

Caption

Sunlight that shines through a bottle of water can make a rainbow of colors.

litvunphoto | Adobe Stock

4

Quality of
Narrative
relative to
Informational
Texts:
Increasingly
Evident as
Text
Complexity
Increases

Summary: Using AI to....

Analyze

Analyze School Texts and Tasks



Select

Select Specific Words & Texts



Enhance

Enhance Explicit Vocabulary Instruction



TextProject



Search for...



Strategies, tools, and texts to bring beginning and struggling readers to proficient levels of literacy

← TextProject

[HOME](#)

[TEACHERS](#) ▾

[PARENTS & TUTORS](#) ▾

[TEACHER EDUCATORS](#) ▾

[RESEARCH](#) ▾

[FRANKLY FREDDY BLOG](#)

[ABOUT](#)



300 free online texts that support
comprehension, vocabulary &
fluency for middle schoolers

[Get TopicReads](#)

More to Read and/or Hear (for free!):

- Hiebert, E. H. (2020). The core vocabulary: The foundation of proficient comprehension. *The Reading Teacher*, 73(6), 757-768.
- Hiebert, E. H. (2024). Unpacking automaticity: Scaffolded texts and comprehension. *Journal of Adolescent & Adult Literacy*.
- Revolutionizing Vocabulary Learning: AI's Contributions to Word Selection in Education <https://textproject.org/vocabulary-learning-and-ai/>
- The Science of Word Zones: How Big Data is Building Better Readers <https://textproject.org/word-zones-science/>
- Using Story Structure for Comprehension and Enhancing Vocabulary <https://textproject.org/story-structure-and-vocabulary/>
- Terminology, Texts and Teachers in an AI World: Possibilities and Problems <https://textproject.org/terminology-texts-teachers-ai/>

Sincerest thank you for
your time & commitment!



hiebert@textproject.org