NYU | STEINHARDT

The NYS Statewide Language Regional Bilingual Education Resource Network

RBE-RN

# Bilingual Pupil Services

## Professional Development

## SIFE & ENTERING/EMERGING STUDENTS

## ENL/MATH

January 11, 2019

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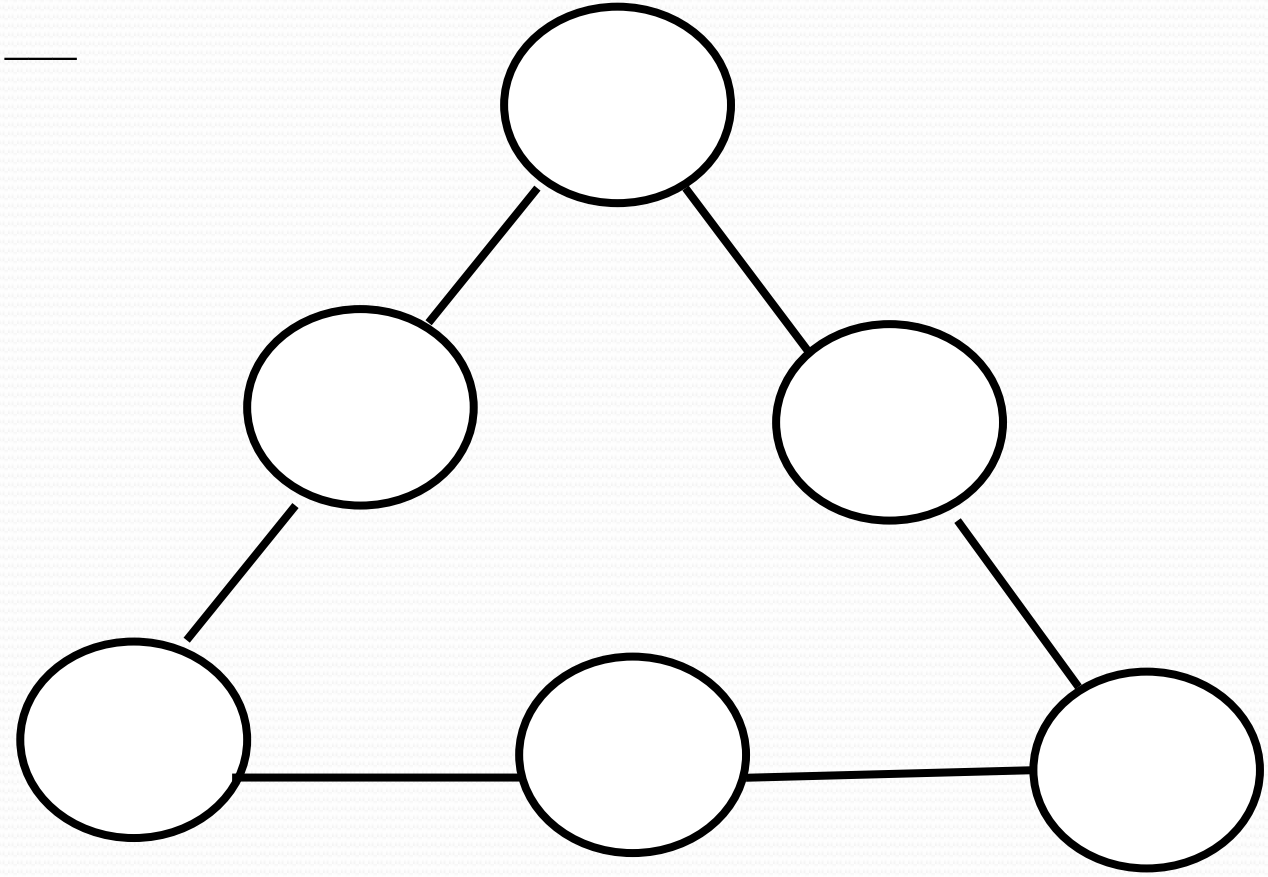
NYS RBERN Resource Specialists

# WARMUP

Place one of these numbers 1, 2, 3, 4, 5, and 6 inside each circle so that the sum of the numbers on the side of the "triangle" is _____.
Do not repeat a number. What pattern(s) have you observed?

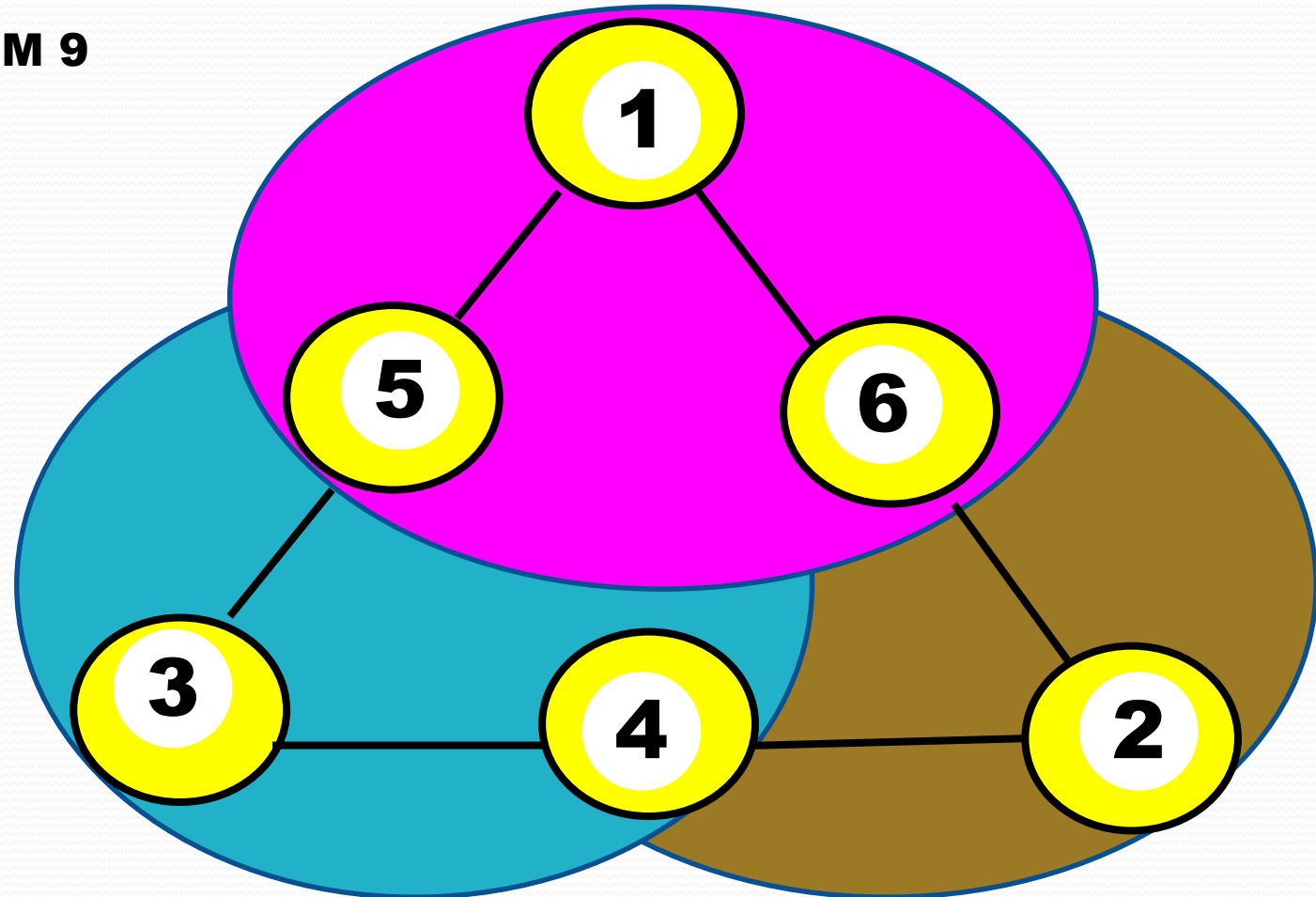
**SUM ___**



# WARM-UP

Place one  of these numbers 1, 2, 3, 4, 5, and 6 inside each circle so that the sum of the numbers on the side of the “triangle” is 9.
Do not repeat a number. What pattern(s) have you observed?

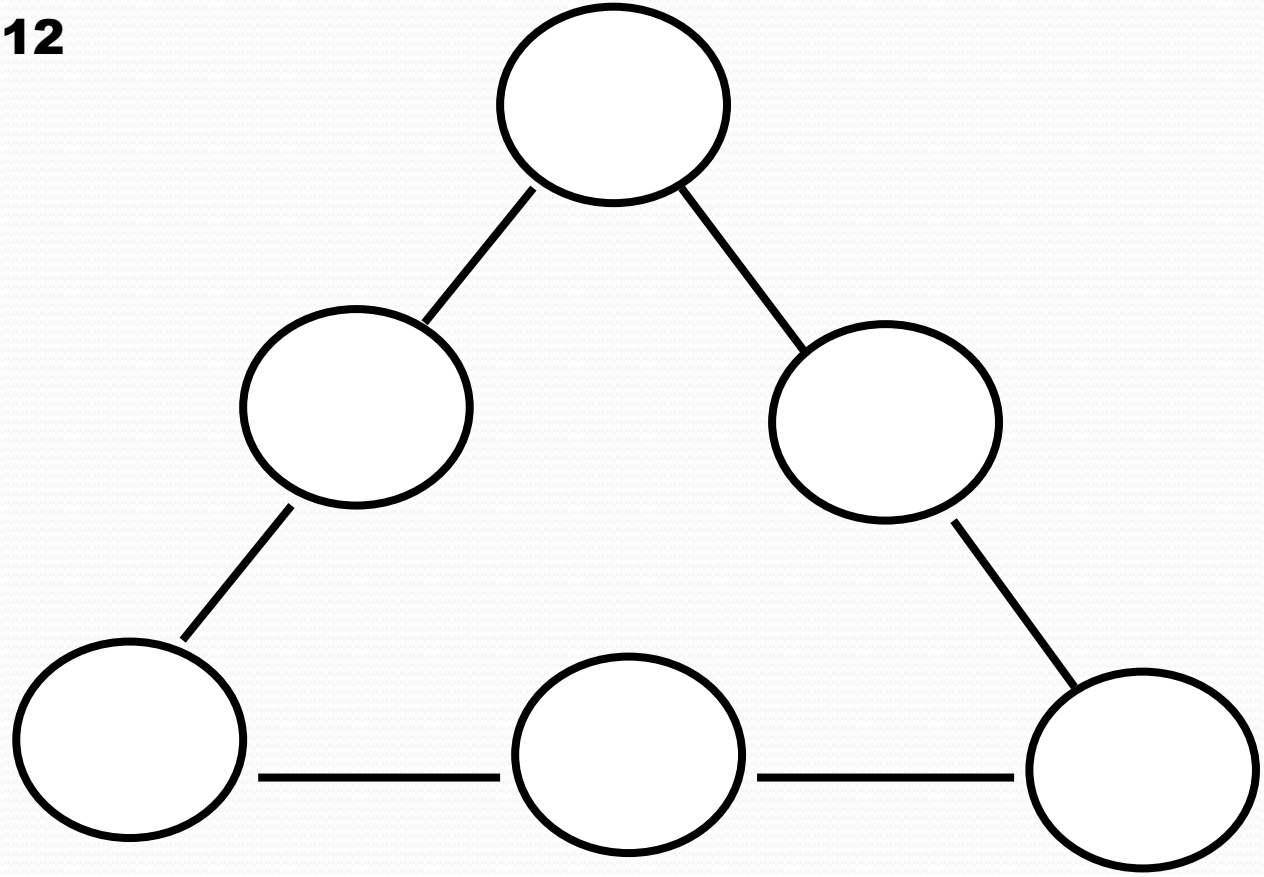
**SUM 9**



# WARM-UP

Place one  of these numbers 1, 2, 3, 4, 5, and 6 inside each circle so that the sum of the numbers on the side of the “triangle” is 12.
Do not repeat a number. What pattern(s) have you observed?

**SUM 12**



# SUM OF 15

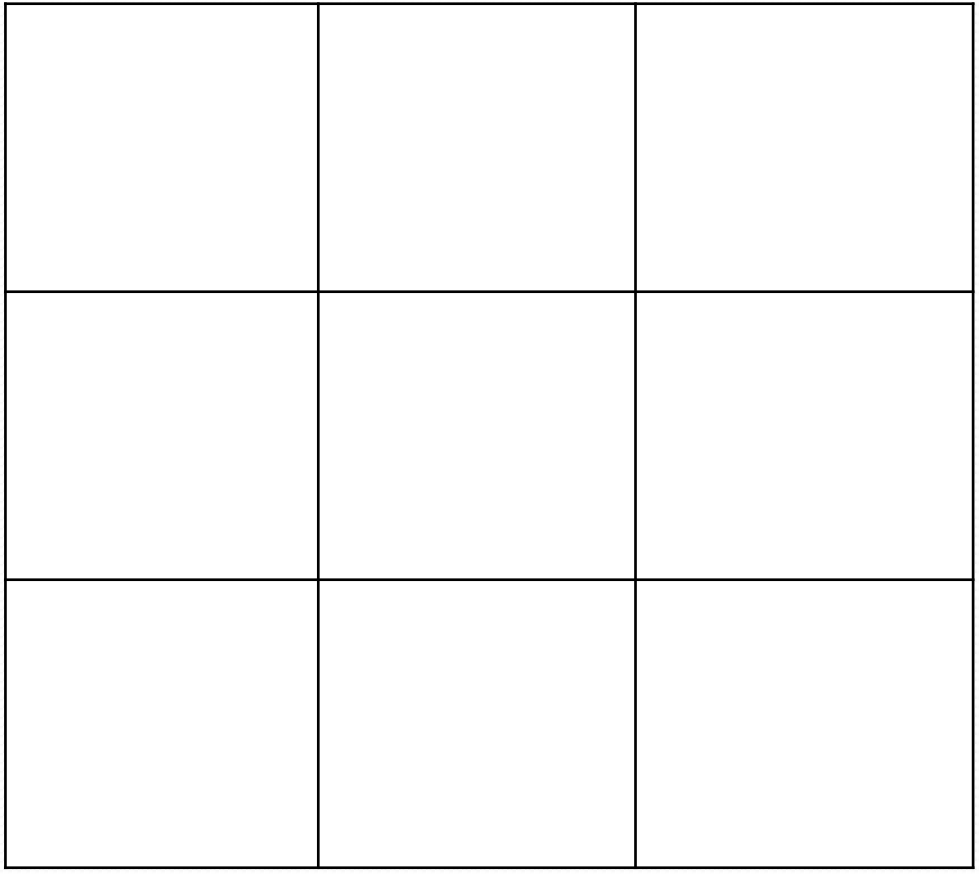
Place one of the number below in each cell of the grid so that their sum is equal to 15 (in either direction) horizontally, vertically, or diagonally:

1, 2, 3, 4, 5, 6, 7, 8, 9

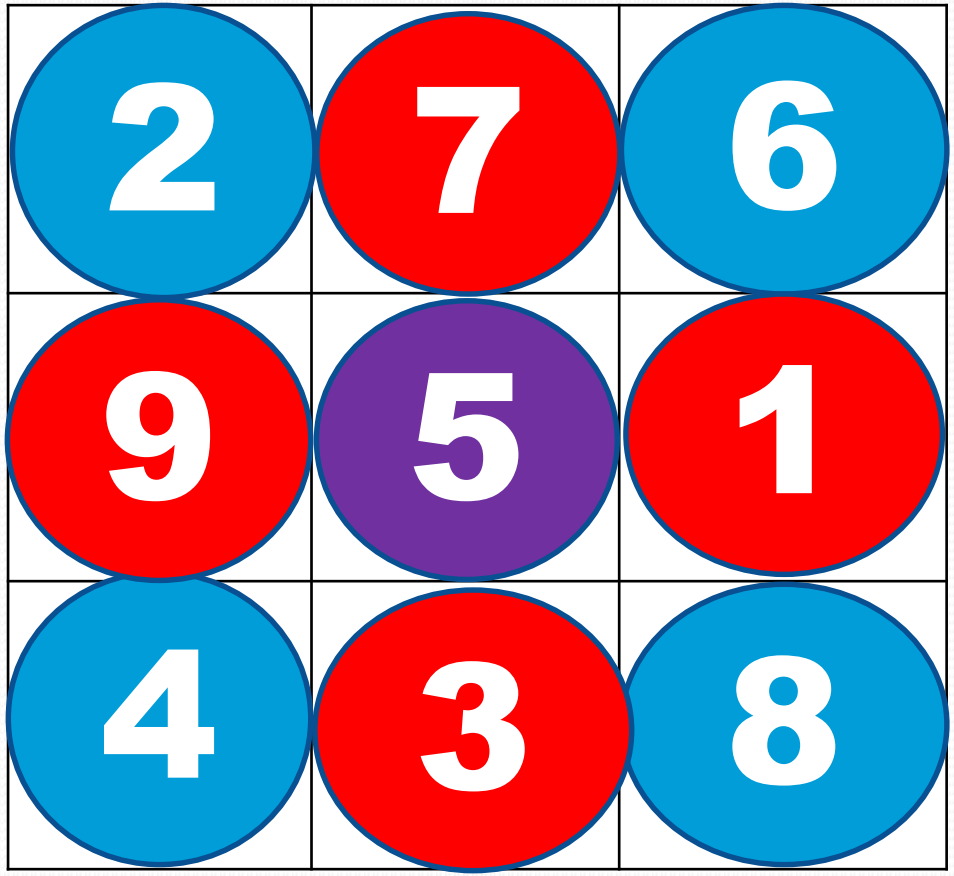
Do not repeat a number.

# 15-SUM

Place one of these number in each cell of the grid so that their sum equal 15, horizontally, vertically, or diagonally: 1, 2, 3, 4, 5, 6, 7, 8, 9. Do not repeat a number.



# 15-SUM



# Goals

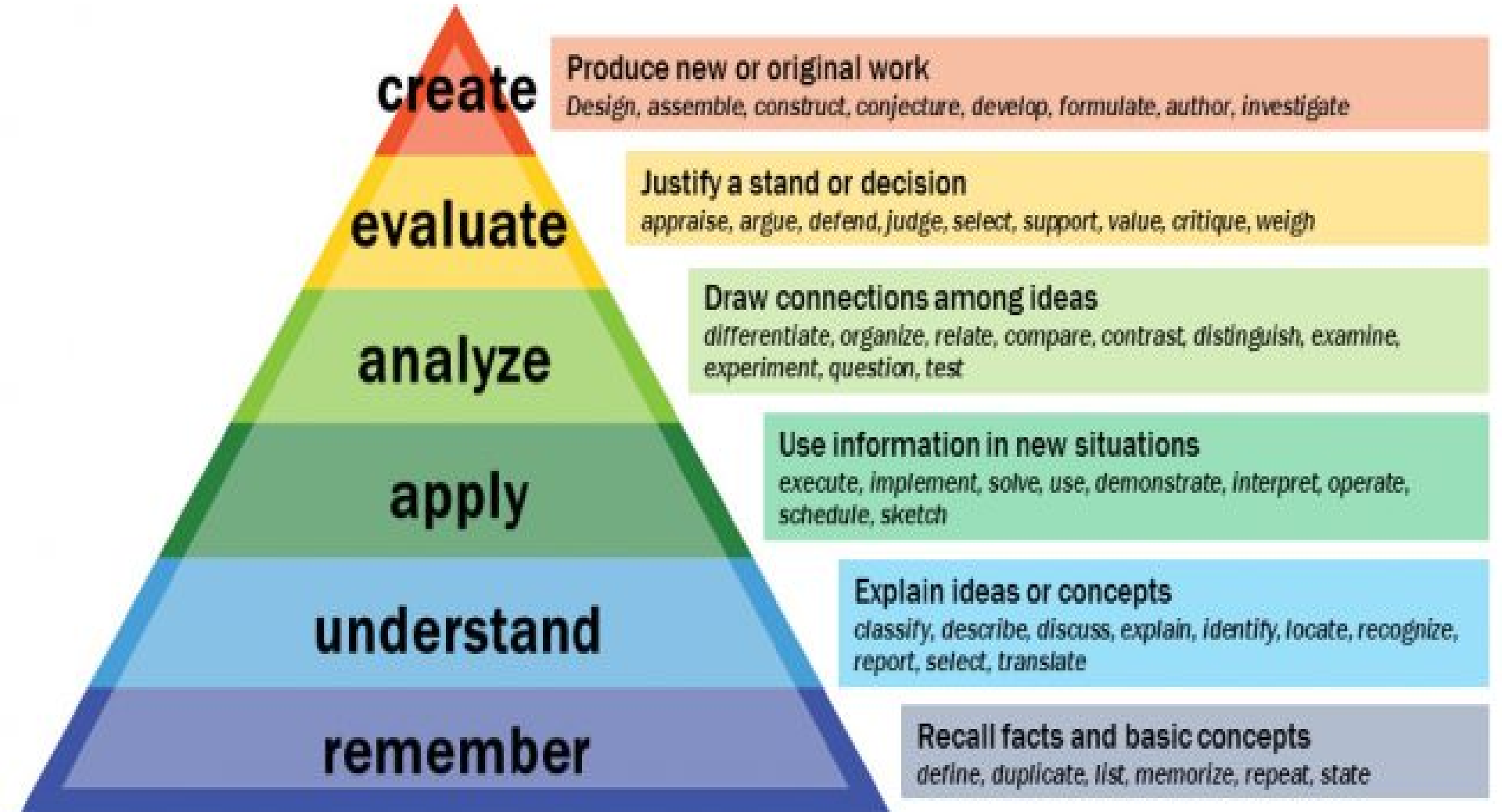
- To identify and discuss modes of transportation using varied strategies, including labeling and repeating.

- To differentiate modes of transportation using different strategies, including sentence starters within the Visual-Vocal-Word-Association (VVWA). Examples:

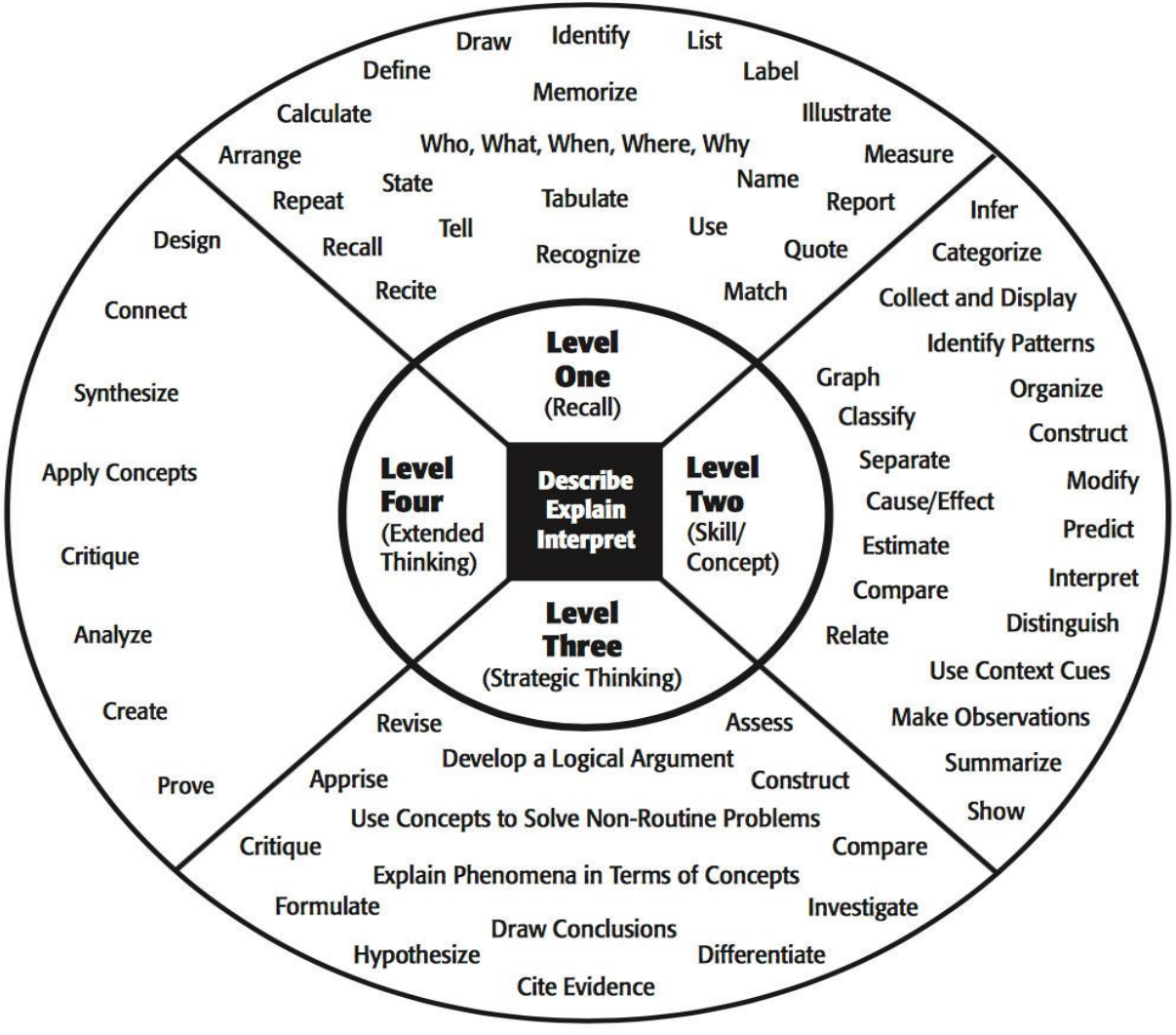
  *I have… Who has..?*
  *I'm going by…Who is going by...?*
  *I like traveling by…Who likes traveling by..?*
  *I'm commuting by..., and I' m wondering who is commuting by?*

- To solve transportation-related math problems using the backwards-solution strategy within the Socratic Method of Teaching and Learning (SMTL).

# Bloom's Taxonomy



# Webb's Depth of Knowledge (DOK) Levels



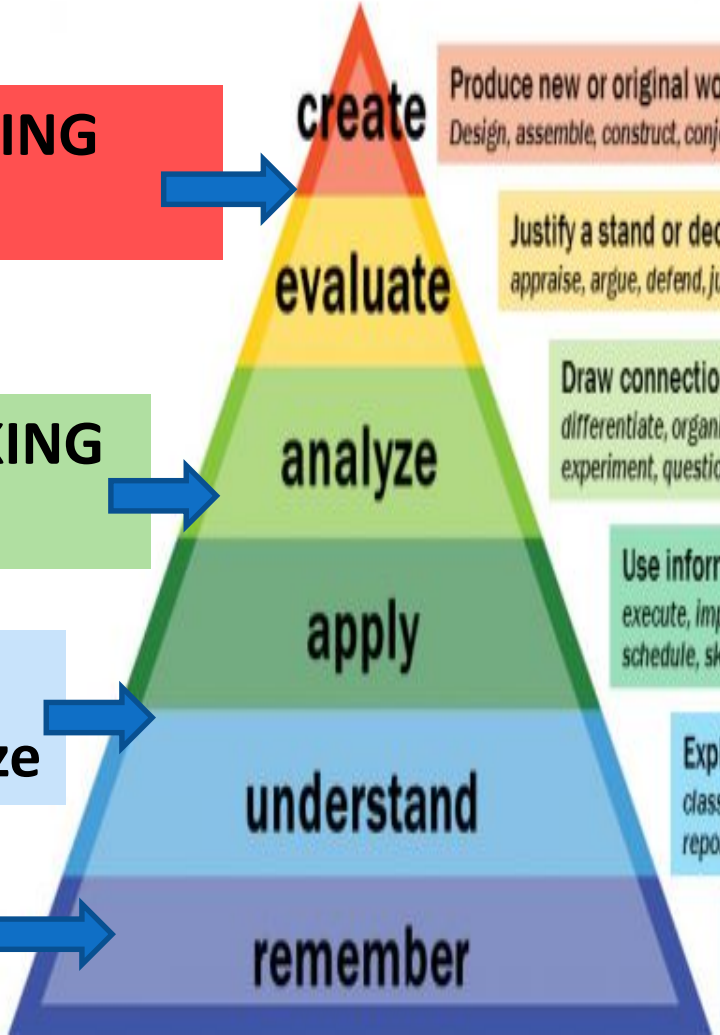
# Webb's DOK vs. Bloom's Taxonomy

**Level 2: EXTENDED THINKING**
**Synthesize & Critique**

**Level 2: STRATEGIC THINKING**
**Compare & Infer**

**Level 2: SKILLS/CONCEPTS**
**Investigate & Hypothesize**

**Level 1: RECALL**
**Memorize & Recall**




**Produce new or original work**
*Design, assemble, construct, conjecture, develop, formulate, author, investigate*

**Justify a stand or decision**
*appraise, argue, defend, judge, select, support, value, critique, weigh*

**Draw connections among ideas**
*differentiate, organize, relate, compare, contrast, distinguish, examine, experiment, question, test*

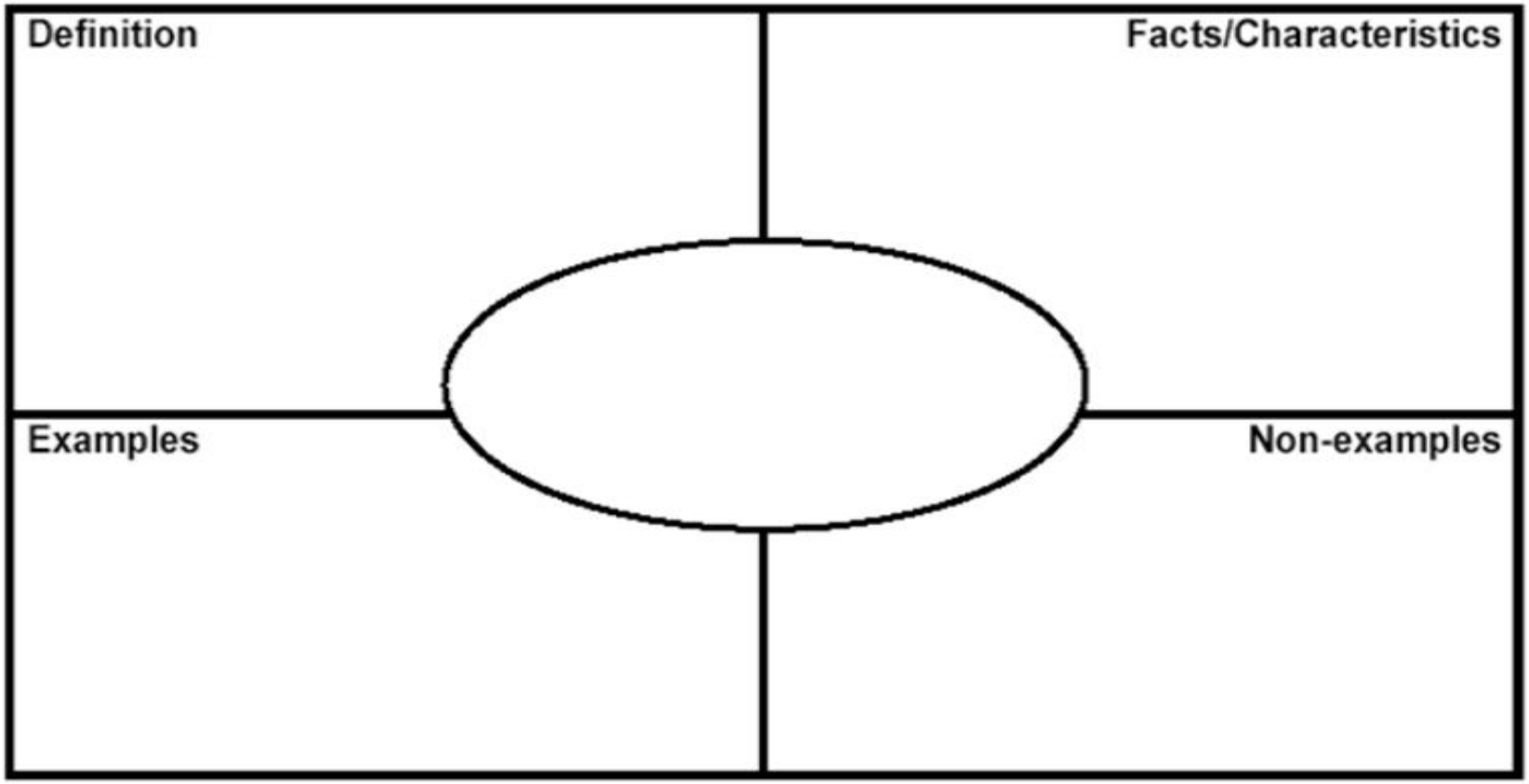
**Use information in new situations**
*execute, implement, solve, use, demonstrate, interpret, operate, schedule, sketch*

**Explain ideas or concepts**
*classify, describe, discuss, explain, identify, locate, recognize, report, select, translate*

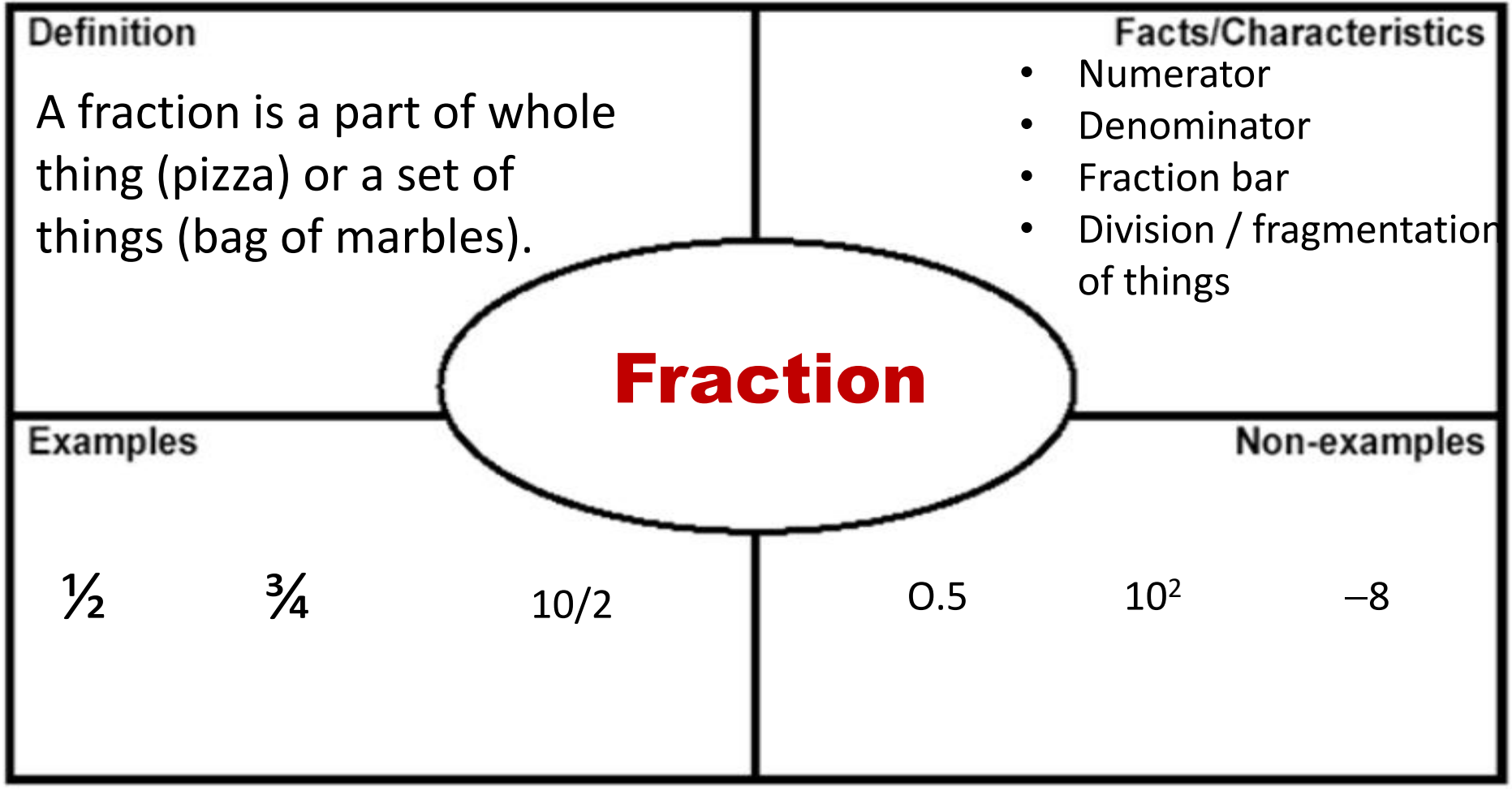
**Recall facts and basic concepts**
*define, duplicate, list, memorize, repeat, state*

# Prior Knowledge

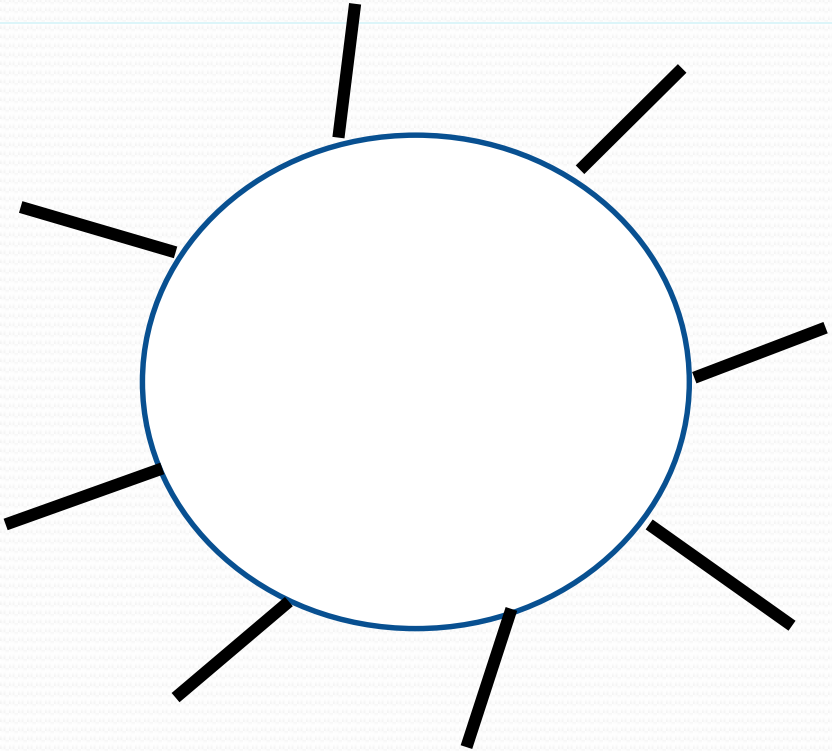
# Frayer Model



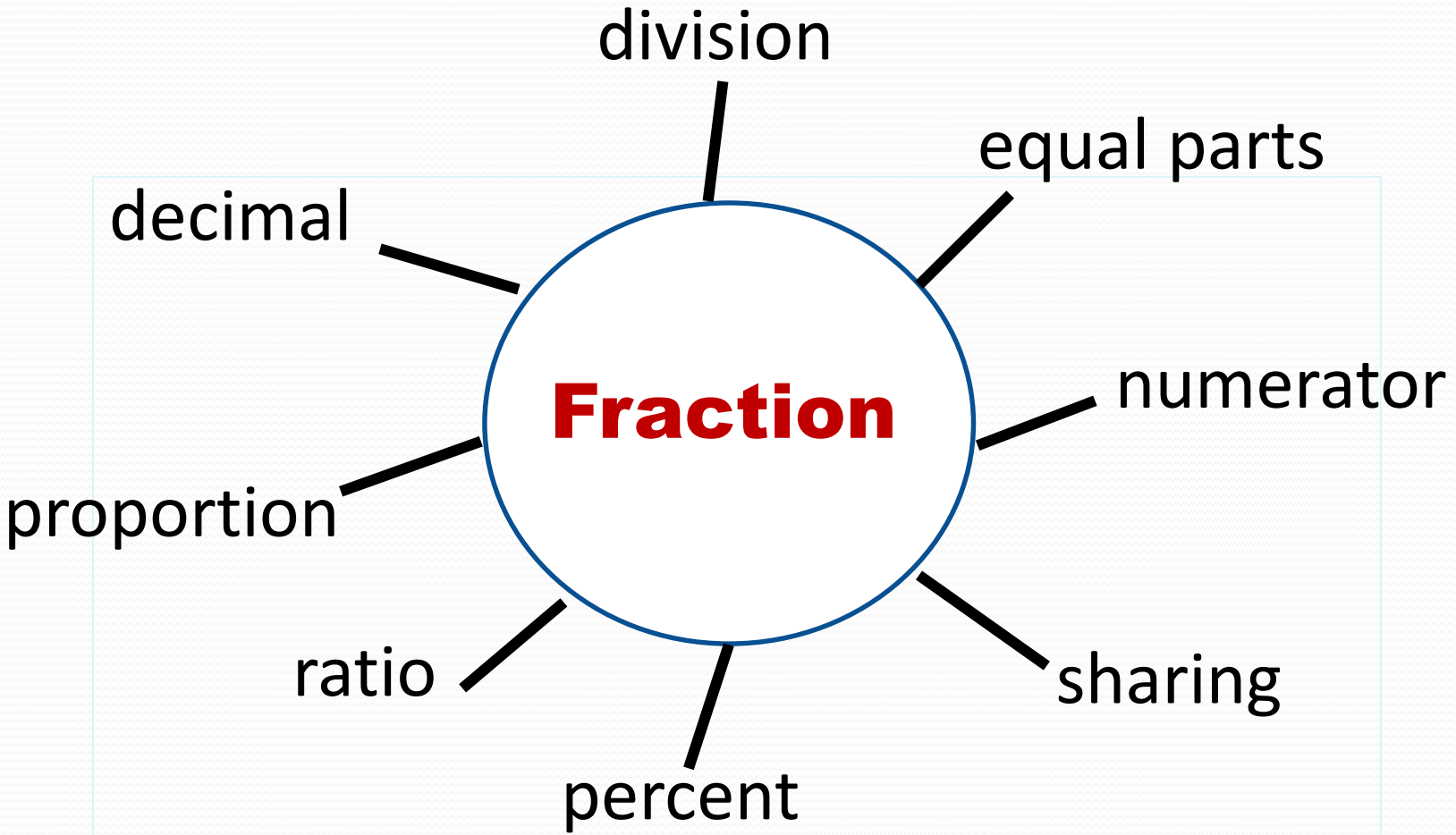
# Frayer Model



# Concept Map



# Concept Map / Brainstorming



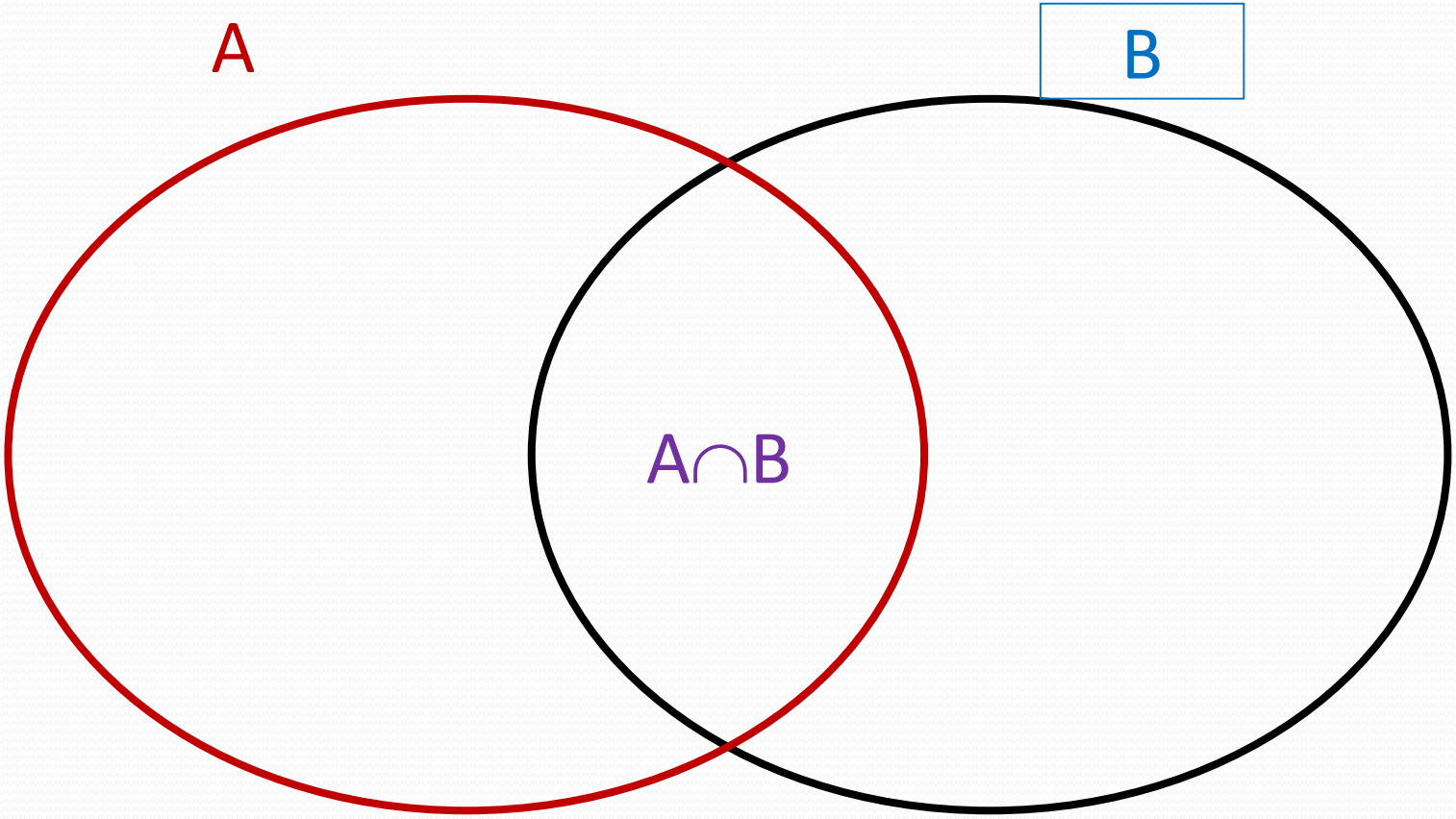
# K W L

| What I know<br>PRIOR KNOWLDEGE | What I want to know<br>GOAL | What I have leanerd<br>OUTCOME |
|---|---|---|
| | | |

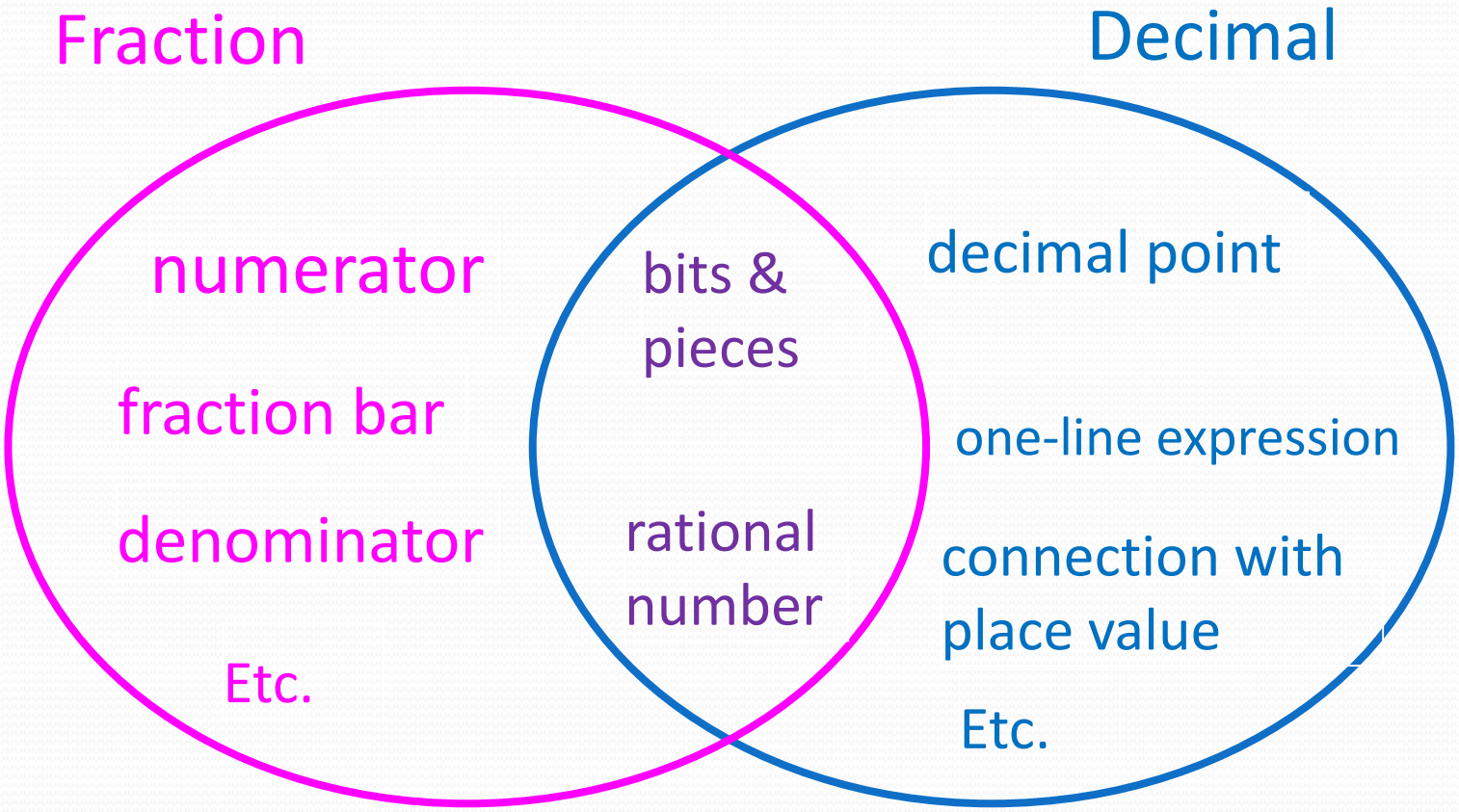
lesson/scaffolding

| K | W | L |
| --- | --- | --- |
| **What I know**<br>PRIOR-KNOWLEDGE | **What I want to know**<br>GOAL | **What I have learned**<br>OUTCOME |
| I can add fractions with like (identical) denominators | How can I add fractions with unlike (different) denominators? | To add fractions with unlike denominators, I must look first for the least common denominator. Then I replace each fraction with their equivalent. Finally, I add the numerators, while keeping the common denominator. |

# Venn Diagram



# Venn Diagram

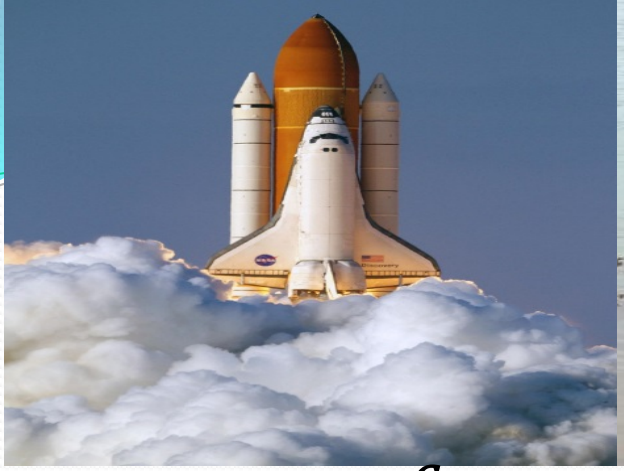


# ENL STRATEGIES FOR ELLs (SIFE & ENTERING LEVEL)

1. Brainstorming/Identifying modes of transportation
2. Reviewing/correcting picture labels of modes of transportation
3. Posting pictures to match labels of modes of transportation
4. Labeling pictures (writing down words) of modes of transportation
5. Anticipatory Guide: Checking for understanding (also for Prior Knowledge)
6. Vocal Visual Word Association (VVWA): Reading/Listening & Speaking
7. Picture Bingo: Listening, Speaking & Reading
8. Riddles: Writing/Making inferences

# ENL STRATEGY-1

## Brainstorming
## Identifying modes of transportation



spacecraft

boat


taxi

roller blade

coach bus


school bus

train


truck

airplane

bike/bicycle

rocket

car

horse

sailboat

helicopter

canoe

stage coach

donkey

motorcycle

scooter

balloon

cruise ship

boat

submarine

fighter jet

warship

spacecraft


cow cart


sledding

walking

# Vocabulary



car train taxi boat truck cow cart scooter

walking rocket donkey balloon airplane horse

warship bike sledding roller blade coach bus

stage coach spacecraft canoe school bus sailboat

submarine motorcycle fighter jet helicopter

How can you adjust this activity (if necessary) for your students?

# ENL STRATEGY-2

Reviewing or correcting picture labels of modes of transportation

submarine ✓

~~taxi~~ *boat*


~~boat~~ *taxi*

fighter jet ✓

spacecraft ✓

~~car~~ *coach bus*

scooter ✓


~~bike~~ *school bus*

train ✓

truck ✓

airplane

~~truck~~

balloon

~~submarine~~

bike ✓

rocket

~~airplane~~

stage coach

~~coach bus~~

car

~~balloon~~

How can you adjust this activity (if necessary) for your students?

# ENL STRATEGY-3

Posting / cutting and pasting pictures to match labels of modes of transportation

Issuing proper IDs

1. canoe

2. Walking

3. airplane

4. stage coach

5. helicopter

6. motorcycle


gettyimages
gchutka

1. canoe

2. Walking

3. airplane


4. stage coach

5. helicopter


6. motorcycle

How can you adjust this activity (if necessary) for your students?

# ENL STRATEGY-4

## Labeling pictures (writing down words) of modes of transportation

1

2

3


4

5

6

7

8

1

submarine

2

boat

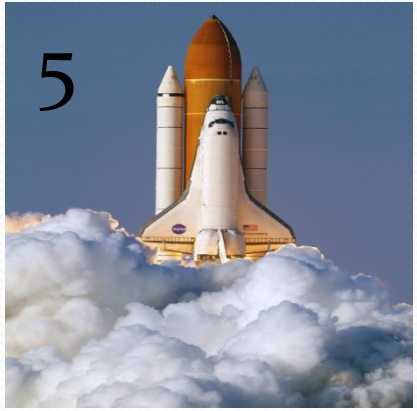
3


taxi

4

fighter jet

5



spacecraft

6

coach bus

7

scooter

8


school bus

How can you adjust this activity (if necessary) for your students?

# ENL STRATEGY-5

# Anticipatory Guide: Checking for understanding

# Anticipatory Guide: Checking for Identification Understanding

| # | Identification of Transportation Modes | Yes | Maybe | No |
|---|---|---|---|---|
| 1 | This  is a car. | | | |
| 2 | This  is a boat. | | | |
| 3 | This  is a taxi. | | | |
| 4 | This  is a school bus. | | | |
| 5 | This  is a coach bus. | | | |
| 6 | This  is a space ship. | | | |
| 7 | This  is a scooter. | | | |
| 8 | This  is a motorcycle. | | | |

# Anticipatory Guide: Checking for Identification Understanding

| # | Identification of Transportation Modes | Yes | Maybe | No |
|---|---|---|---|---|
| 1 | This  is a car. | | | X |
| 2 | This  is a boat. | ✓ | | |
| 3 | This  is a taxi. | ✓ | | |
| 4 | This  is a school bus. | | | X |
| 5 | This  is a coach bus. | ✓ | | |
| 6 | This  is a space ship. | | | X |
| 7 | This  is a scooter. | ✓ | | |
| 8 | This  is a motorcycle. | ✓ | | |

How can you adjust this activity (if necessary) for your students?

# ENL STRATEGY-6

# Vocal Visual Word Association (VVWA)

## Listening & Speaking Activity

# Vocal Visual Word Association (VVWA)
# Listening & Speaking Activity

- Student A: What is it?

- Student B: It's a...bike.

What is it?

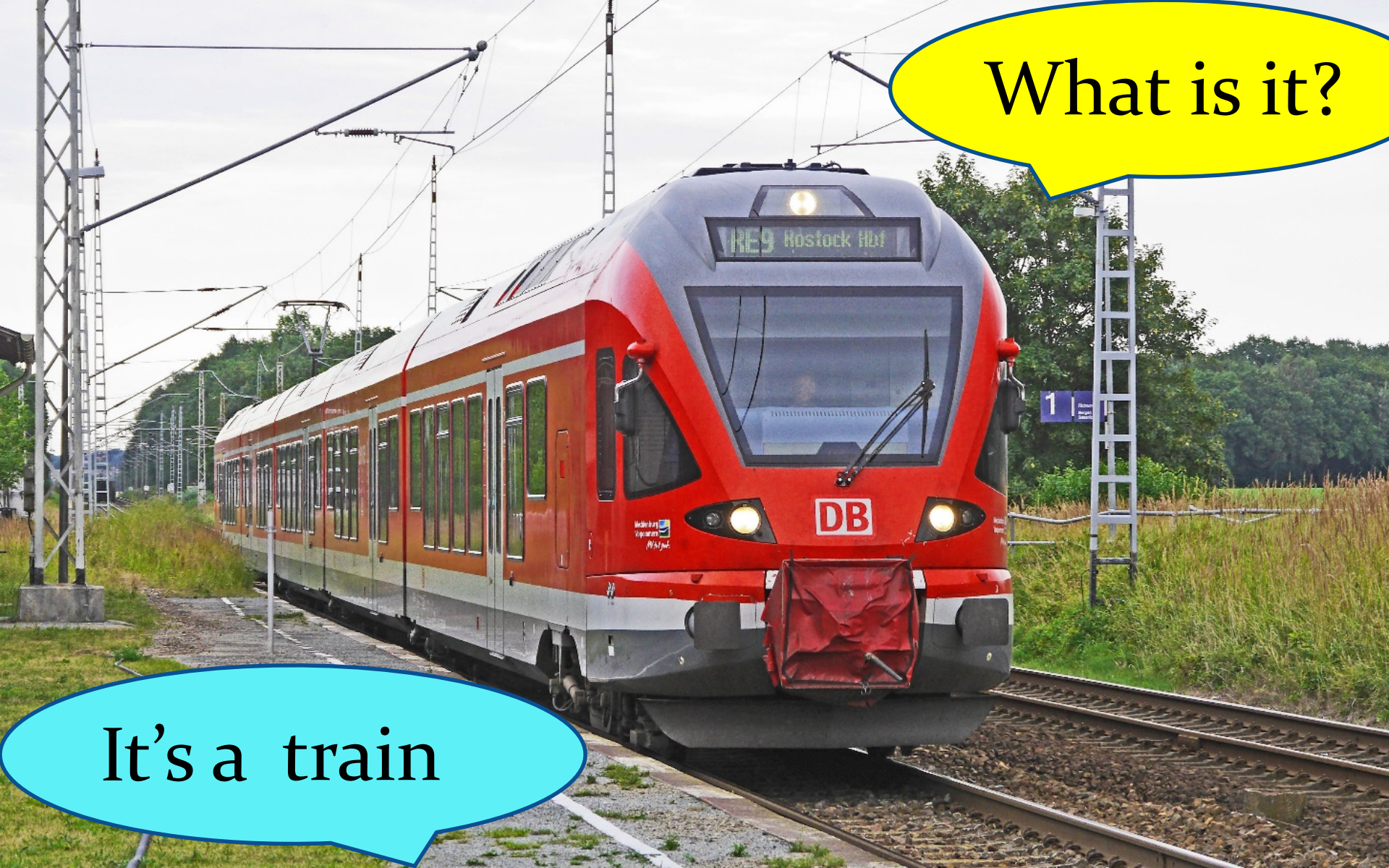
It's a... car

What is it?


It's a bike

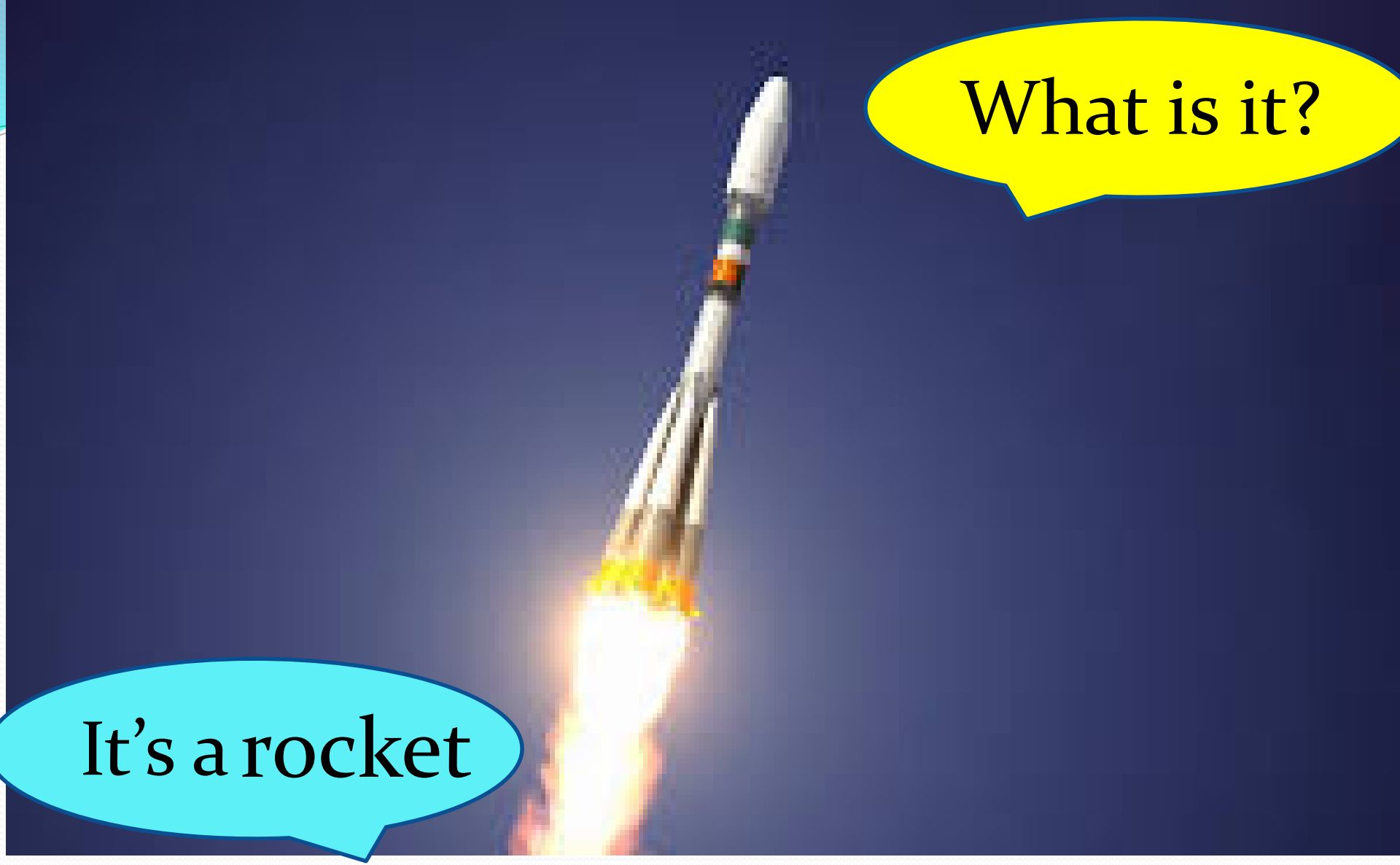
What is it?

It's a truck


What is it?
RE9 Rostock Hbf
DB
1
It’s a train


TAXI
What is it?
It’s a taxi


What is it?
It's a cruise ship


What is it?
It's a rocket

# Other Versions of VVWA

# Listening & Speaking Activity
# Vocal Visual Word Association (VVWA)

A: I have a  Who has a  ?

A: I have a  . Who has a  ?

A: I have a  . Who has a  ?

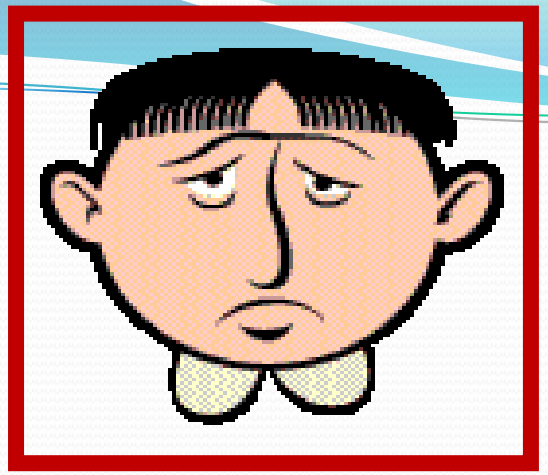
# Vocal Visual Word Association (VVWA)

## Listening & Speaking Activity

A: I'm going by  . Who is going by  ?

B: I'm going by  . Who is going by  ?

C: I'm going by  . Who is going by  ?



Sorry!
No More
Transportation
Modes!

How can you increase the level of sophistication of this activity?

ENL STRATEGY-7

# PICTURE BINGO

car

taxi

boat

train

truck

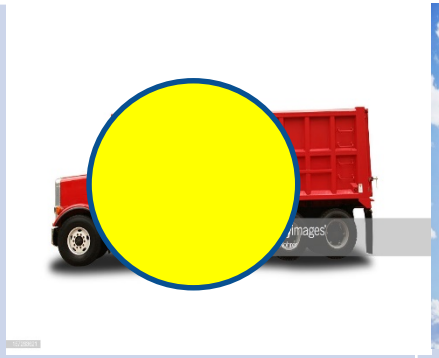
bike

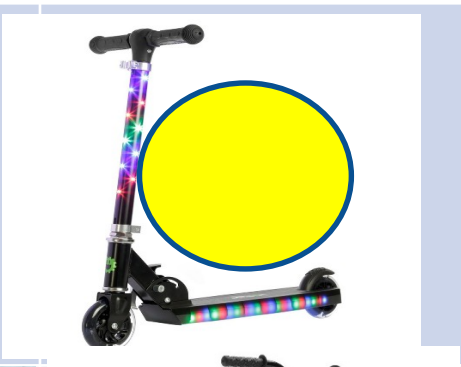
scooter

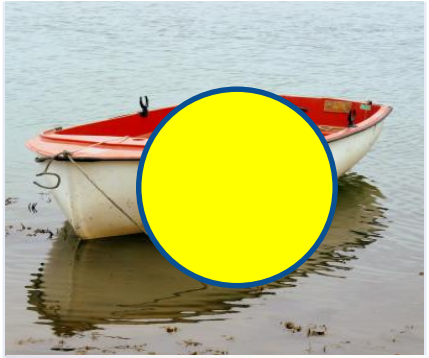
airplane

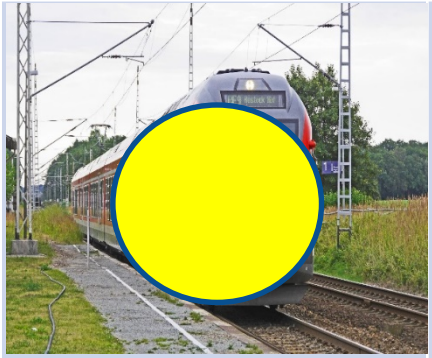
submarine

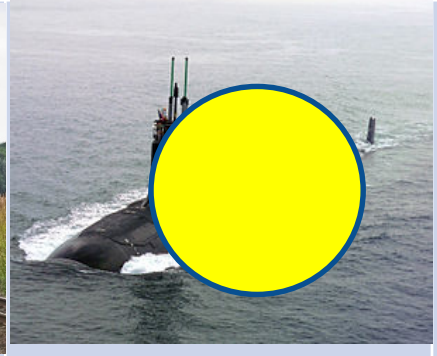
# PICTURE BINGO











How can you adjust this activity (if necessary) for your students?

# BINGO 2



# BINGO 3



# BINGO 4














# BINGO 5











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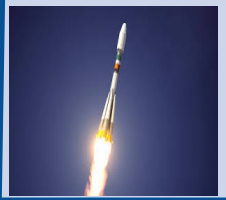

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How can you adjust this activity (if necessary) for your students?

STRATEGY-8

# Riddles:
# Making Inferences

# ENL Riddles

## WHO AM I?

1. I travel under the sea. _____

2. I take students to school. _____

3. I travel into space? _____

4. I am the fastest with 2 wheels. _____

5. I carry passengers for a fee. _____

6. I am part of the air force. _____

# ENL Riddles

## WHO AM I?

1. I travel under the sea. submarine

2. I take students to school. school bus

3. I travel into space? spacecraft

4. I am the fastest with 2 wheels. motorcycle

5. I carry passengers for a fee. taxi

6. I am part of the air force. fighter jet

How can you adjust this activity (if necessary) for your students?

# Models of Sequential Lessons for SIFE and Entering Students, Re: Bloom & DOK

# Models of Sequential Lessons for SIFE and Entering Students, Re: Bloom & DOK

1. Repeat after me:

car 

boat 

bike 

2. Point to the boat…car…bike…car



3. Say Yes or No.

Is it  a car?

It is  a boat?

4. Circle Yes or No.


boat

Yes No


bike

Yes No


car

Yes No

5. Say and write the word for each picture.


_____


_____


_____

6. Cut and paste a picture above each word.

car bike boat

# Transportation-related Mathematics

WARMUP

# Adverb-Percentage Connection
# Language-Math Connection

Complete the table using the adverbs on the left to match the given percents on the right.

| Percentages | Adverbs |
|---|---|
| 100% | always |
| 90% | usually |
| 50% | sometimes |
| 10% | rarely |
| 0% | never |

- In light of this activity, what can you conclude?
- What are some implications for classroom instruction?

# MATHEMATICS

## Overview

I. The 4 pillars of Mathematics Teaching & Learning

II. Math Scaffolding (Singapore Model)

III. The Socratic Method for Teaching & Learning- Backwards Solution

IV. Group Activities

G1. Taxi Ride

G2. Airplane Travel

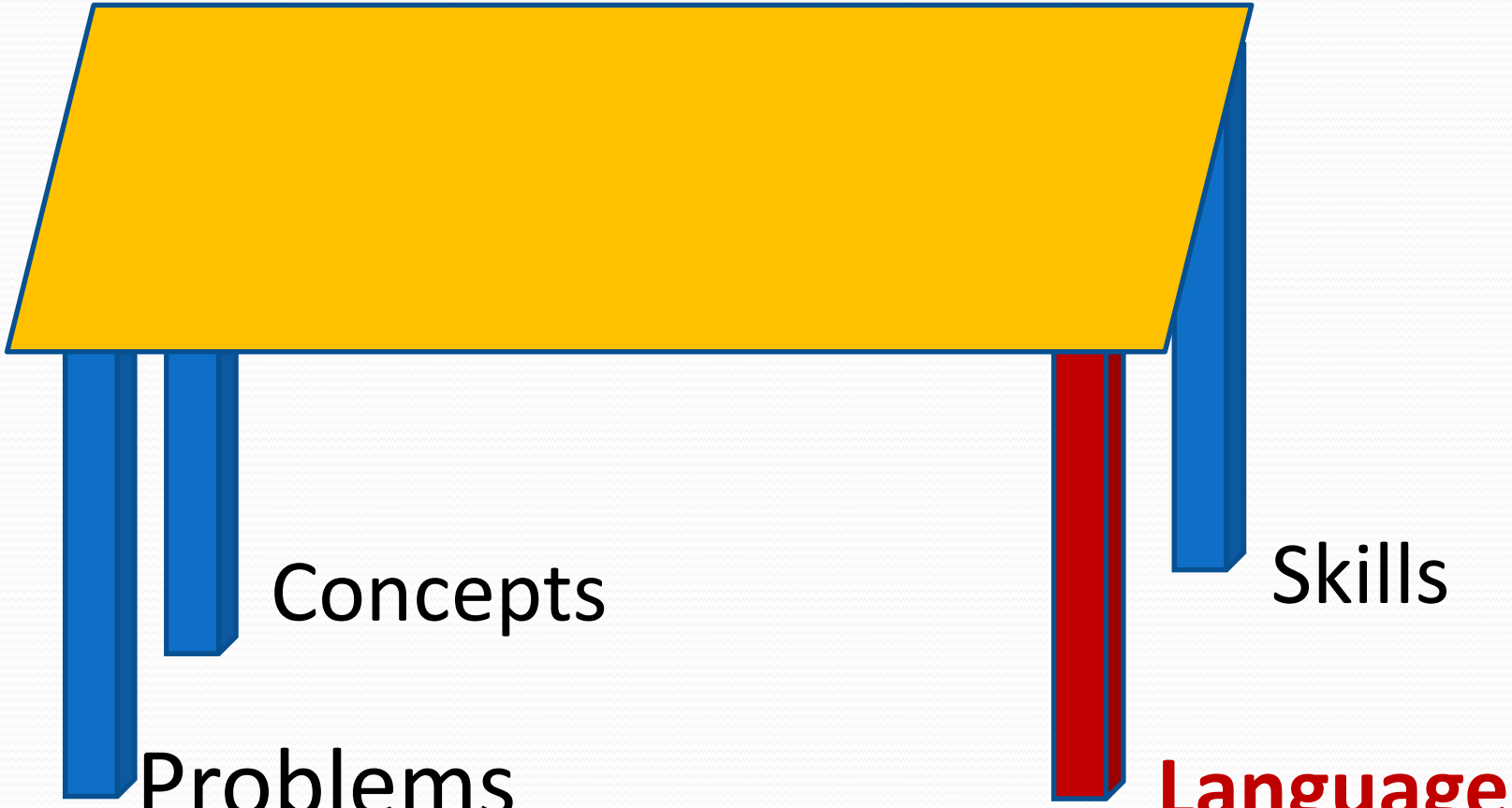
G3. Transit Travel: PAP-MIA-NY

G4. The Gas Tank

V. General Reflections/Implications for your classrooms

VI. Questions & Answers

# The 4 Pillars of 21st Century Math



# Syntax within the Math Register

1. The syntax / sentence structure of math can be troublesome. Example: *3 subtracted from 5 equals 2 can be written as* $5 - 3 = 2$.

2. At times, key words can be deceiving. Use logic instead. Example:

*John has 2 cats and 4 dogs. How many cats does he have in all?*

# Some Foundational Math Terms

| | | | |
|---|---|---|---|
| addend | minuend | factor | dividend |
| odd | subtrahend | multiple | divisor |
| more than | less than | product | quotient |
| even | less than | twice | remainder |
| double | prime | power | percent |
| sum | difference | composite | inverse |

# Vocabulary
## Types of Words

One-meaning words vs. multiple-meaning words

| | | | |
|---|---|---|---|
| table | domain | exponent | dividend |
| volume | root | hypotenuse | gross |
| power | bank | coefficient | terms |
| total | odd | equation | trapezoid |

# Modeling

## Solidifying Understanding
## Singapore Method

- The bike travels 15 mph. The horse travels three times faster than the bike does. How fast does the horse travel?

?

1 time | 2 times | 3 times

15 mph | 15 mph | 15 mph

45 mph

15 mph

15 + 15+15

or

$3 \times 15$

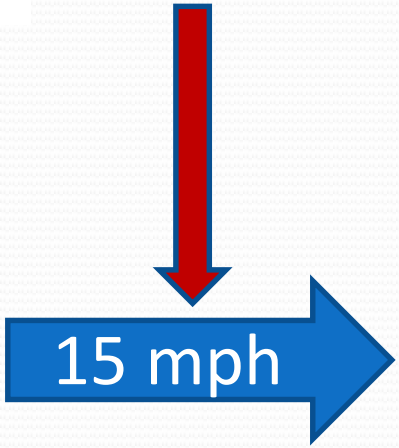
# Modeling

Solidifying Understanding
Singapore Method

- The horse travels 45 mph. The bike travels three times slower than the horse does. How fast does the bike travel?

horse = 45 mph


?




45 – 15 – 15

or

45÷ 3

bike = 15 mph

# Practice Problem

Solve each problem using the Singapore Method.

**Problem 1.**  speed = 350 mph.  5 times faster. So speed = _____

**Problem 2.**  speed = 60 mph.  3 times slower. So speed = _____

**Problem 3.**  speed = 40 mph.  As fast as. So speed = _____

# Socratic Method

## Backwards Strategy Problem Solving through Probing Questions

# Taxi Ride


## Facts (Taxi Fare)

- **Initial** fee = $3
- ½ mile = $1.50
- Distance = 16 miles
- **Tip** = $5

## Questions

- Change out of $50 bill?

# Modeling

## Backwards Solution Strategy (Socratic Method)

## Taxi Ride

### Facts (Taxi Fare)

- Initial fee = $3
- ½ mile = $1.50
- Distance = 16 miles
- Tip = $5

### Questions

- Change out of $50 bill?

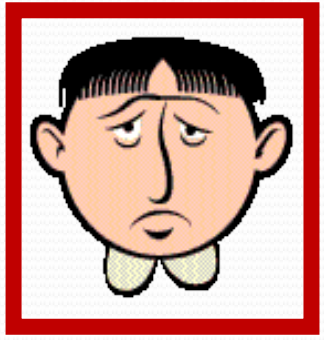
### Logical Reasoning

- Change = Purse – Total expense
- Do I know the purse? Yes. $50 ✓
- Do I know the total expense? No X
- Total expense = Initial fee + tip + mileage
- Do I know the initial fee? Yes. $3 ✓
- Do I know the tip? Yes. $5 ✓
- Do I know the mileage? No X
- Mileage = $1.50 × number of ½ miles
- Do I know the number of ½ miles? No X
- Number of ½ miles = 16 × 2 ✓

### Solution Steps

*Answer: Missing $6. Purse not enough.*

**Oooops!**



**4. Change**
**$50 – $56 = –$6**

**3. Total expense =**
**$3 + $5 + $48 = $56**

**2. Mileage cost = $1.50 × 32 = $48**

**1. Number of ½ miles = 16 × 2 = 32**

# Practice Problem

## Airplane Travel

## Facts

- Tickets = $1,200 per adult
  3 times cheaper per child
- Guest house = $300 per night
- Stay = 1 week
- Budget =$7,000

## Questions

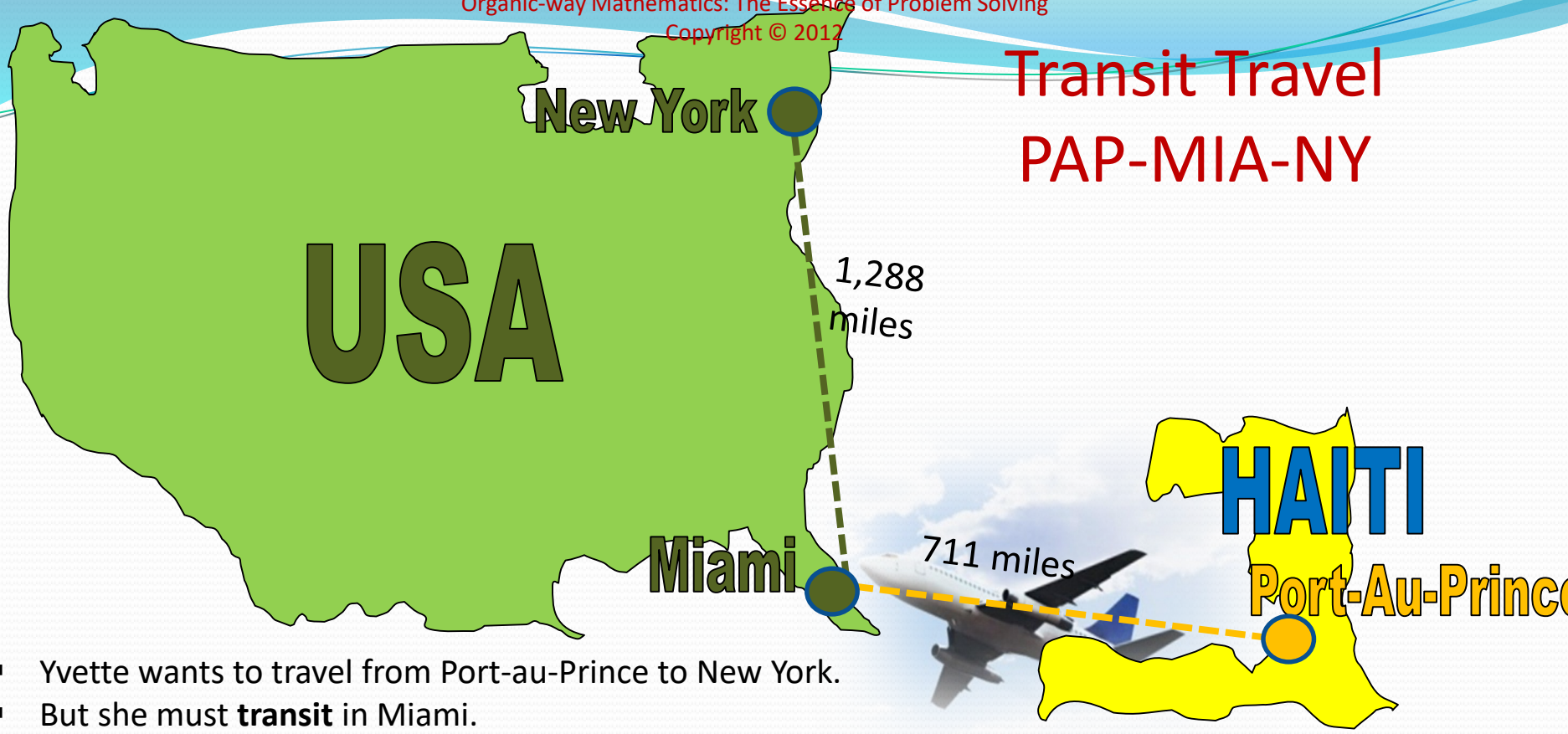
- Enough Budget?
- Explain.

# The Gas Tank

Complete the table.

| Distance covered | Gas left in Tank | Gas Burned |
|---|---|---|
| 0 mile | _____ gallons | _____ gallon |
| 90 miles | 40 gallons | _____ gallons |
| | | |
| 360 miles | 10 gallons | _____ gallons |
| _____ miles | 0 gallon | _____ gallons |

# Transit Travel
# PAP-MIA-NY




- Yvette wants to travel from Port-au-Prince to New York.
- But she must **transit** in Miami.
- The distance between Port-Au-Prince and Miami is 711 miles.
- The distance between Miami and New York is 1,288 miles.
- Yvette has **already flown 80%** of the **total** distance.
- How much distance has Yvette left to travel in order to reach **destination**?

# Math Journal

# vs.

# Learning Journal


# END

# APPENDIX

# Not part of this PD

(Follow-up Lesson)

# An immigrant story

(Follow-up Lesson)

## An Immigrant Story- Level 1

I was maybe three years old. Then my father **flew** to **America**. He left me behind with Mom. Everybody was happy. Everybody was sad. Dad will make more money. But Mom and I would be all alone. We played more often. We had a lot of fun. We went to church.

We missed dad a lot. **Maybe**, he missed us too. He never wrote letters. Instead, he called us. The phone rang every evening. He sent money to us by Western Union. We **bought** more **healthy** foods. We bought nicer clothes. We bought good leather shoes.

# (Follow-up Lesson)

## An Immigrant Story- level 1 (continued)

Six years later, Dad came back home. We were **excited**. We celebrated every day. We bought more **expensive** things. Then he returned to New York. He promised to send for us. He kept his **promise**.

One summer, Mom and I flew to New York. Dad was waiting at the airport. He took us into his nice car. He drove us to his apartment in The Bronx. We saw very tall buildings. The family was **reunited** again. I happened to like America. Here in America, we have a lot of **opportunities**.

# (Follow-up Lesson) An Immigrant Story- level 2

I was probably three years old when my father traveled to America. He left behind Mom, Granma, and me. My mother told me that. He was **excited** to get an American visa. He knew that he would most likely going to work for more money. At the same time, Dad was sad. He was going to certainly missed us. Once in New York, he **seldom** wrote letters. Instead, he would call at night probably coming from work. There were many ways to send money from America. But he always used the Western Union. Mom and I would go downtown to the bureau to pick up the cash. The cashier always kept a small part of our money.

Six years had passed. My family was reunited temporarily. My father returned from New York for the very first time. Everybody was **elated**. We consumed **exotic** foods which we could not afford before. However, we felt **morose** because we realized that he would soon fly back to America. Suddenly, we felt the **loneliness** creeping back. As consolation, he promised to send for us soon. Indeed, he kept his promise. Three years later, Mom, my baby brother, and I **immigrated** to New York. We went to live in Dad's building apartment on the secongd floor in Brooklyn. The family was together once more. For good!

I love to live in America. This country offers me a better opportunity to be whatever I want to be. I can even become more popular than the most popular vowel.

# (Follow-up Lesson) An Immigrant Story- Level 3

According to my mother, I must have been three years old when my father **hit the skies** en route to America, leaving us behind. I only had some **scant** recollections of him. Like many other immigrants, he was extremely **thrilled** to have obtained a visa to the **wealthiest** country on earth. He was **convinced** then he would be earning more money. Simultaneously, Dad was consumed with **morosity**. He knew he would absolutely miss us.

Once he reached The United States, he would write once in a while. **Nonetheless**, he would consistently ring during recess from work. Usually, my mother had already retired for the day prior to those **nocturnal** calls punctuating the **serenity** of the night. Mom was even more e**xuberant** to commute downtown every other week to the Western Union bureau to claim the remittance Dad had wired. The Diaspora probably used the service of other money transfer companies. But it appeared that my father was a **faithful** customer of this particular business. He must have been very popular there. Anyway, the transfer allowed us to meet our financial obligations.

After six long **melancholic** years, my father finally returned home. We **rejoiced** over **exotic** foods that had been beyond our reach in the past. **Occasionally**, we felt gloomy at the thought of Dad's prospective return overseas. As **solace**, he pledged he would have **emigrate** from Haiti. He had honored his promise, indeed. Two summers later, my mother, my baby brother, and I immigrated to join Dad in his second-floor apartment in Brooklyn. Wow! The family was, at last, reunited for good.

I had no idea of what I would do if I were to stay with Granma. I did love her **tremendously** for many reasons. For example, she would take me sometimes to church on Sundays and i**ndulge** me with ice cream and cookies after Mass. How can I forget that? **Nevertheless**, America offers me more than that—a **unique** opportunity to become whatever I set my goal on.

# Comparative Adjectives

(Follow-up Lesson)

# (Follow-up Lesson)

fast – faster
slow – slower
Hard - harder
tall – taller than
short – shorter
smart – smarter
big – bigger
small – smaller

pretty – prettier
close – closer
green – greener
old – older
tiny – tinier
healthy – healthier
good – better
bad – worse

# (Follow-up Lesson)

| | |
|---|---|
| fast - faster | ▪ The bike is fast. But the car is faster.<br>▪ The car is faster than the biker. |
| tall - taller | ▪ Joe is tall. But Mark is taller.<br>▪ Mark is taller than Joe. |
| slow - slower | ▪ The cat is slow. But the turtle is slower.<br>▪ The turtle is slower than the cat. |
| smart - smarter | ▪ Mary is smart. But Shayenne is smarter.<br>▪ Shayenne is smarter than Mary. |
| good - better | ▪ Your work is good. But mine is better.<br>▪ My work is better than yours. |
| bad - worse | ▪ Not working hard is bad. But being absent is worse.<br>▪ Being absent is worse than not working hard. |