Scaffolding in Education – the Legos in Explicit Instruction

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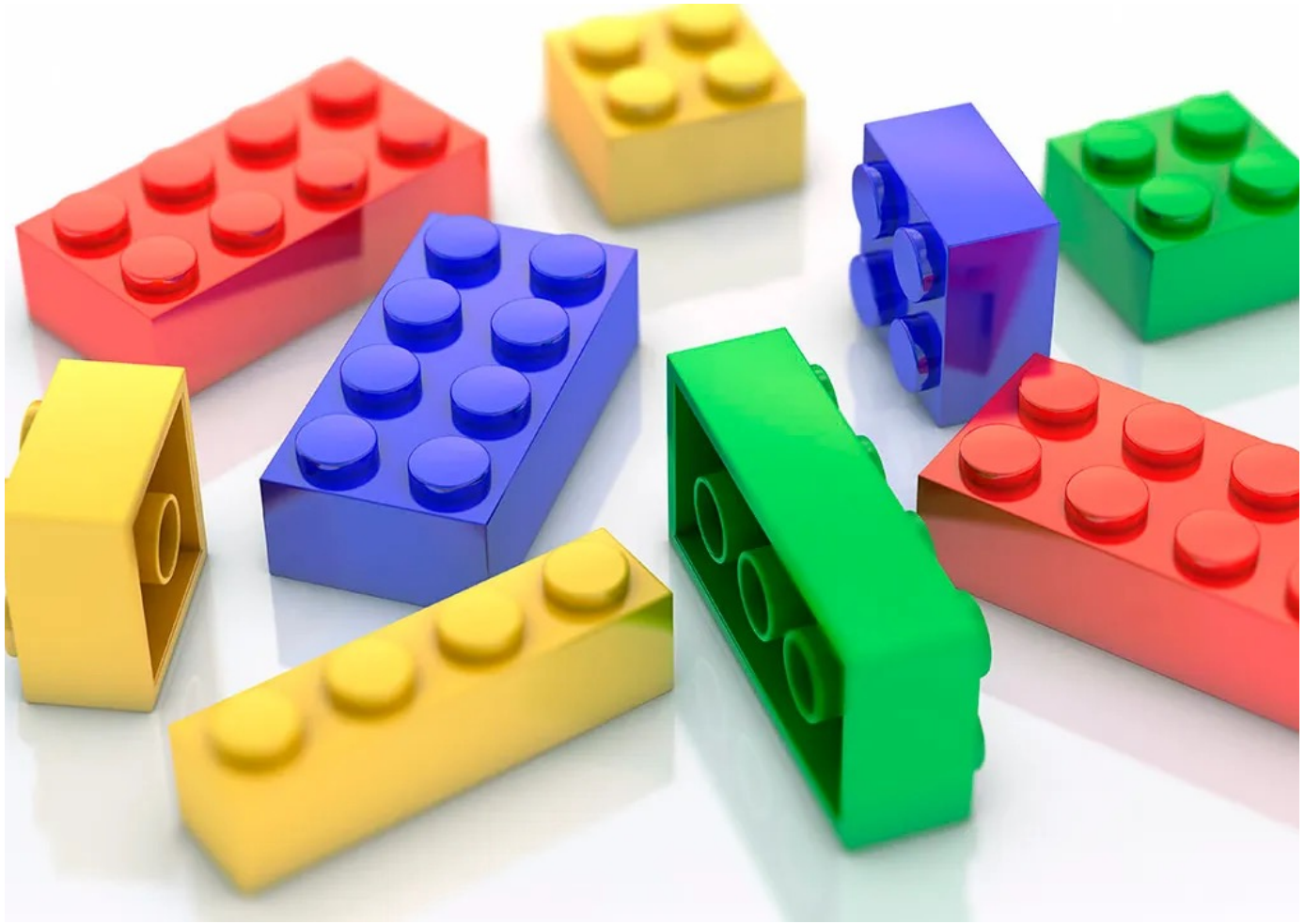

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Learning Objectives

1. **Today we will review the research of Hermann Ebbinghaus and its role in the Science of Learning.**
2. **Today we will learn 6 Scaffolding strategies to use in your school/classroom.**

Group Attention Signal & 1,2,3 numbers

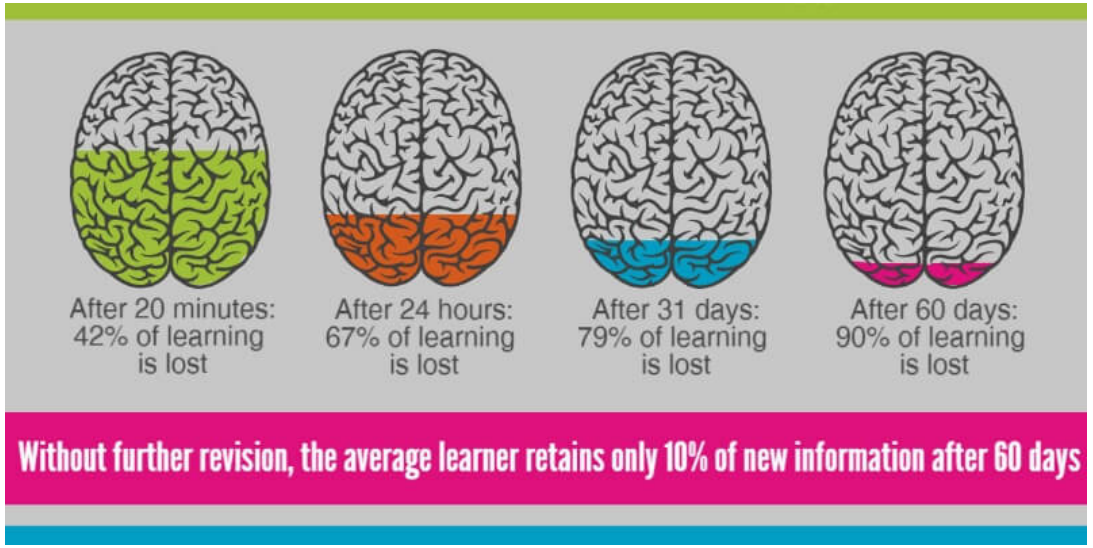

RAFFLE

What Is The Science of Learning?
(A basic definition)

- Over the last 20 years the field of Cognitive Science (a.k.a The Science of Learning) has made enormous gains in understanding how students learn.
- Humans are complex beings. Our mental processes and behaviors make up our personalities; we are the product or our thoughts, feelings, and actions.
- How we make memories, solve problems and even learn language is part of cognitive psychology.
- Cognitive psychology takes into consideration how the mind and specific behaviors affect learning. It concerns itself on the journey, not the beginning or the destination itself.
- **Cognitive psychology is what happens between initial thought and action taken. It is the process of learning, especially what makes that process most effective.**

Research on Memory and Learning

- Memories are like spiderwebs, strands of recollection distributed across millions of connected neurons.
- When a student learns something new, the material is encoded across those neural networks, converting the experience into a memory.
- Hermann Ebbinghuas discovered through his landmark research in the field of retention and learning the forgetting curve, a measure of how much we forget over time.
- He discovered **without reinforcement or connections to prior knowledge**, information is quickly forgotten – 56% in 1 hour, 66% after a day, & 75% after 6 days



What is Scaffolding?

- The term Scaffolding originated from construction.
- It is used for the temporary structure that is built for the builders to stand on while putting up new walls and grounds.

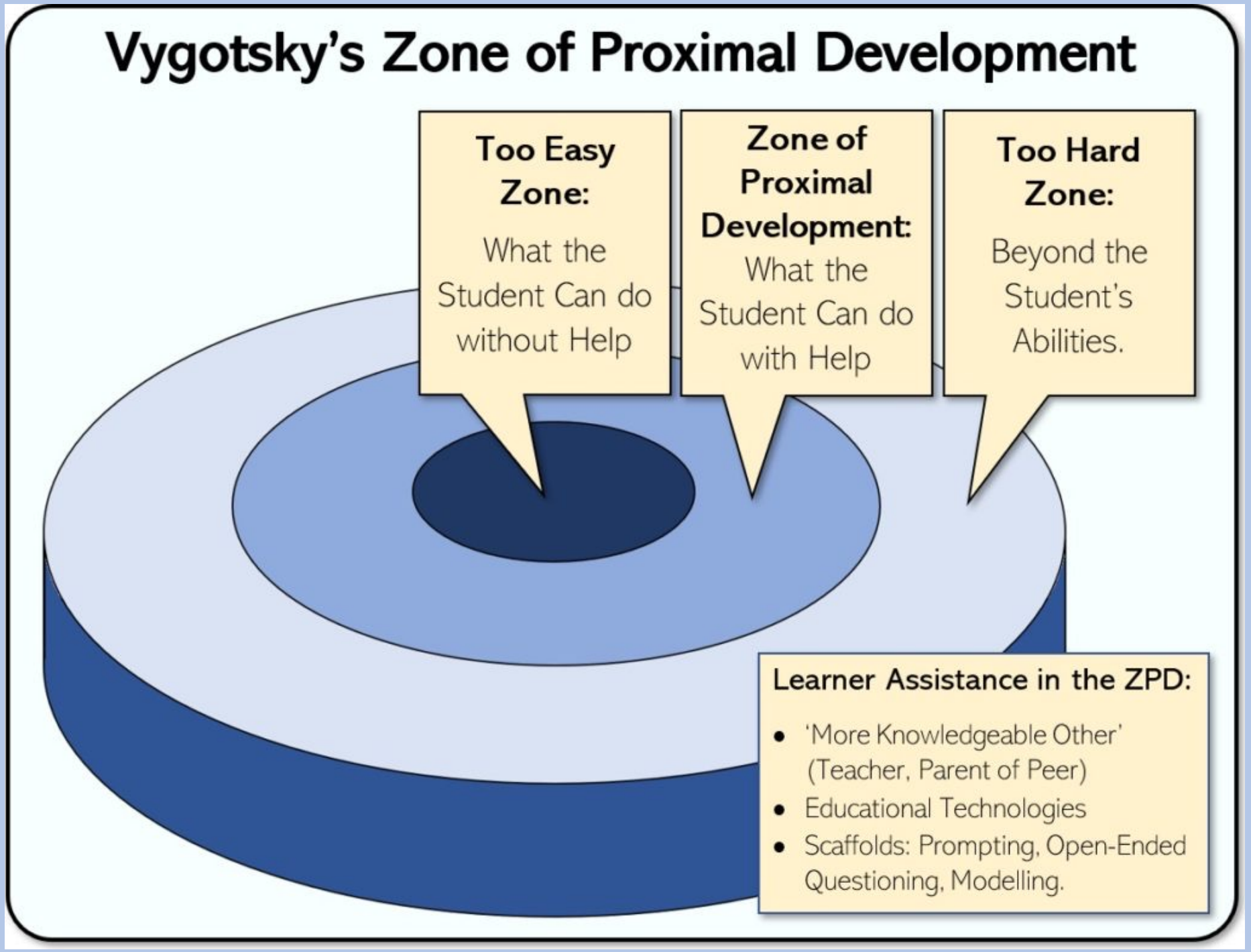
History of Scaffolding in Education

- The word scaffolding was first used by the psychologist Jerome Bruner in the 1960s.
- According to Bruner's Scaffolding theory, **when students are provided with the support while learning a new concept or skill, they are better able to use that knowledge independently.**
- In fact, Jerome Bruner, David Wood, and Gail Ross first used the term scaffolding while applying Vygotsky's concept of Zone of Proximal Development(ZPD) to diverse educational contexts.

The Zone of Proximal Development (ZPD)

- The Zone of Proximal Development (ZPD) was a key construct in Lev Vygotsky's theory of learning and development.
- The Zone of Proximal Development is defined as **the space between what a learner can do without assistance and what a learner can do with adult guidance or in collaboration with more capable peers**.

Vygotsky's Zone of Proximal Development



Scaffolding in Education

- Scaffolding in education, is a teachers' strategy for providing assistance while students master new skills and concepts.

Scaffolds are...

1. Sensitive to students' strengths and challenges
2. Standards-based
3. In alignment with learning targets (objectives)

1. Applied to the process of meeting the learning target
2. Strategically placed as supports into a lesson (not DI)
3. With differentiation, you might give a child an entirely different piece of text to read, or shorten the text or alter it, or modify the writing assignment that follows.

1. Building towards the independence of the student
2. Used to provide a student with necessary supports to accomplish a task that is not otherwise possible
3. Appropriate to the task

1. Respectful for all learners
2. Allows all students access to grade- level content within a lesson
3. Allows students to develop the knowledge, skills, and language to support their own performance in the future

1, 2, & 3 TEMPORARY

It creates an environment where students are encouraged to be more independent in their learning and to not constantly look to the teachers for answers and instruction.

Scaffolding is not simply giving students the answers, but helping students understand the chain of reasoning or evidence that leads to an answer.


RAFFLE

Time to Play with Legos

- Take out your legos
- Choose 2 legos
- Write on the side of the 1st lego “July Instructional Coaches Meeting”
- Write on the side of the 2nd lego “6 Scaffolding Strategies”
- Place lego #2 on top of lego #1
- Place legos to the side

6 Scaffolding Strategies

1) Activate Prior Knowledge

2) Pre-teach Vocabulary

3) Show & Tell (Think Aloud)

4)Visual Aids

5) Give Time To Talk

6) Pause, Ask Questions, Pause, Review (PAQPR)

Science: Earth and Space

1) Activate Prior Knowledge

- Ask students to share their own experiences, hunches, and ideas about the content or concept of study and have them relate and connect it to their own lives.
- Sometimes you may have to offer hints and suggestions, leading them to the connections a bit, but once they get there, they will grasp the content as their own.
- **Launching the learning in your classroom from the prior knowledge of your students and using this as a framework for future lessons is not only a scaffolding technique—many would agree it's just plain good teaching.**

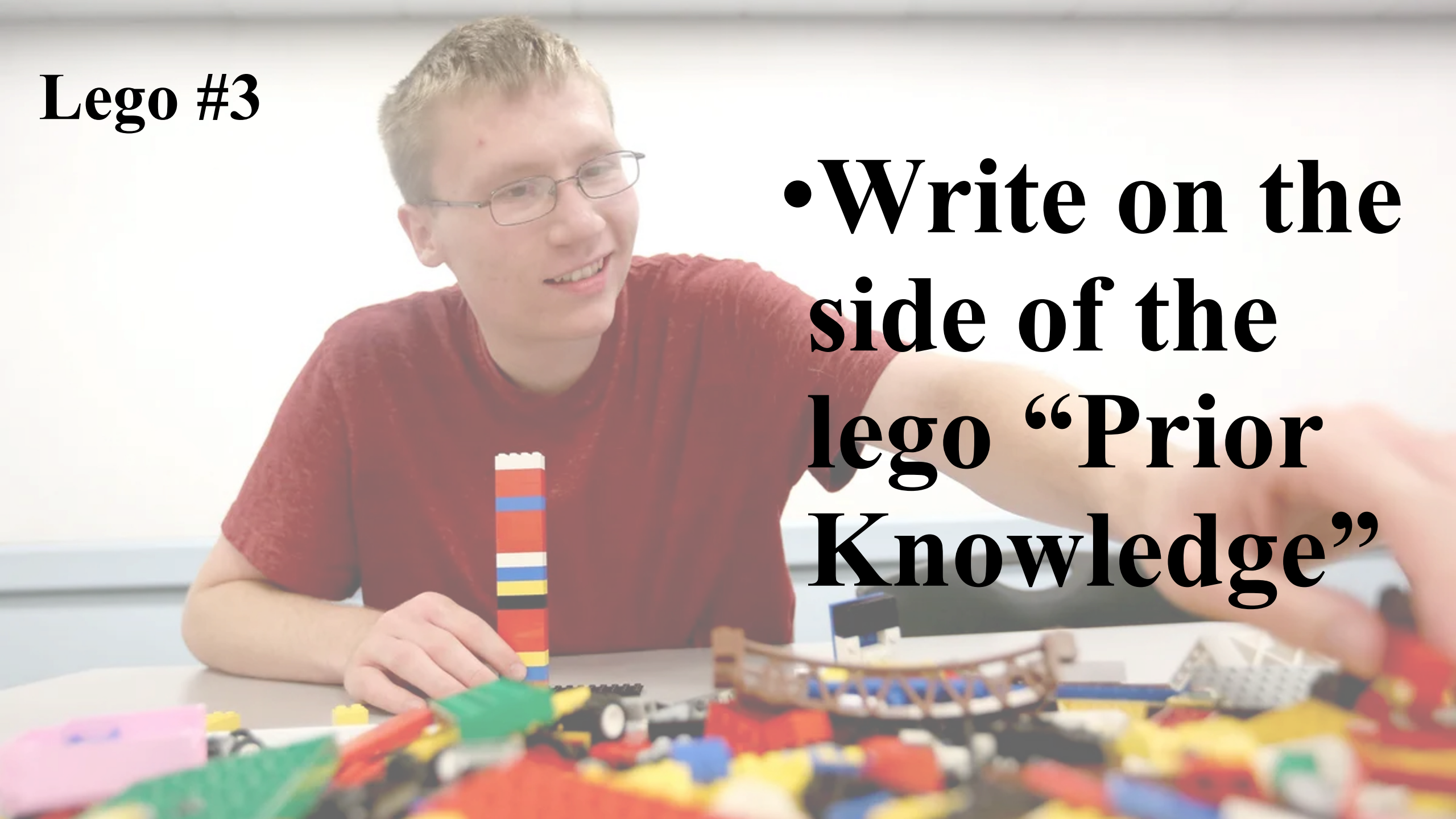
Examples of How to Activate Prior Knowledge

- Forecasting
- Brainstorm
- Graphic Organizer
- Hot Potato
- Concept Map
- Anticipation Guide
- ABC Chart
- **K-W-L Chart**
- Word Cloud
- Power Previewing

Activate Prior Knowledge

- Let’s share what we know about the sun.

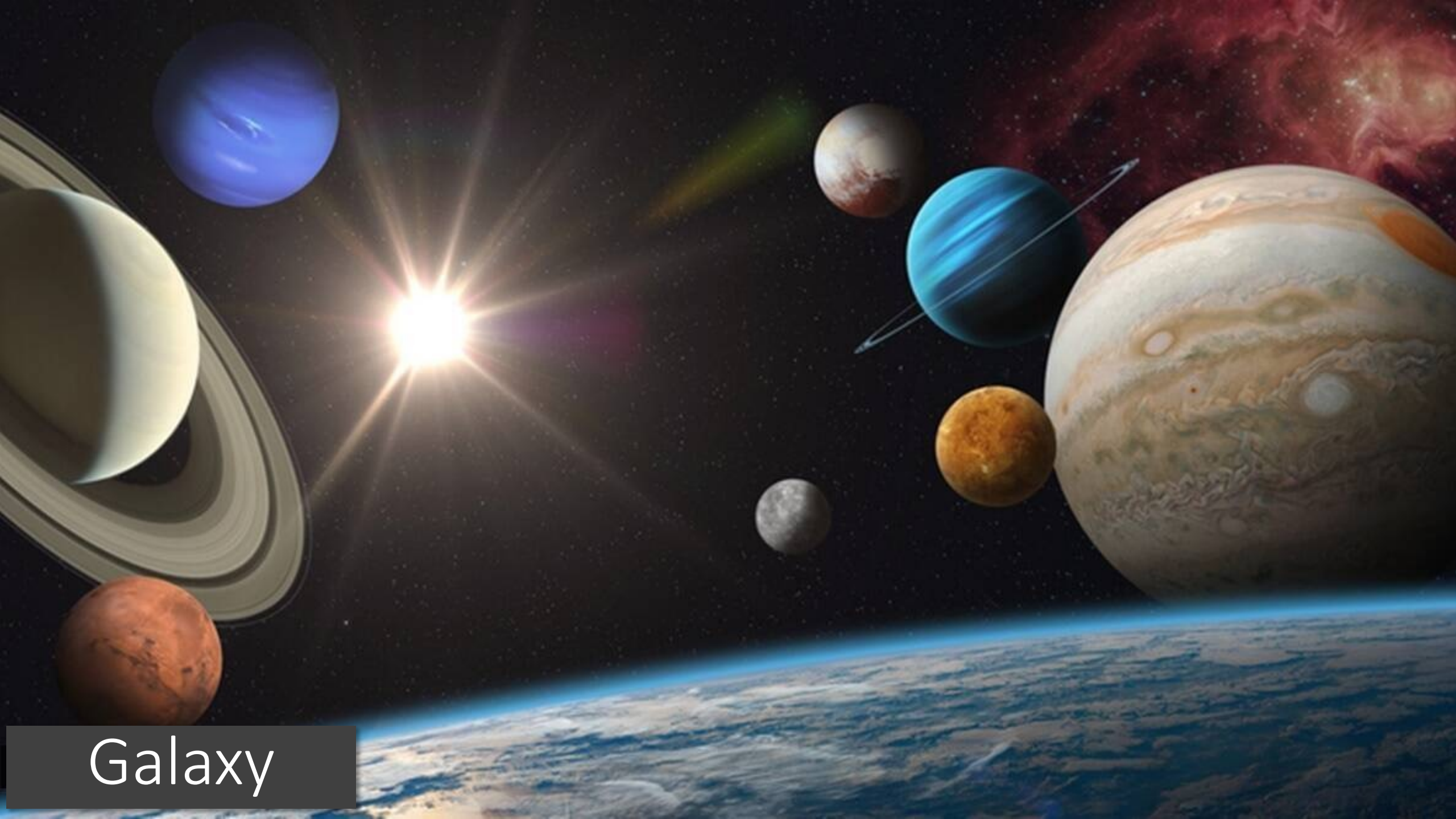
Lego #3

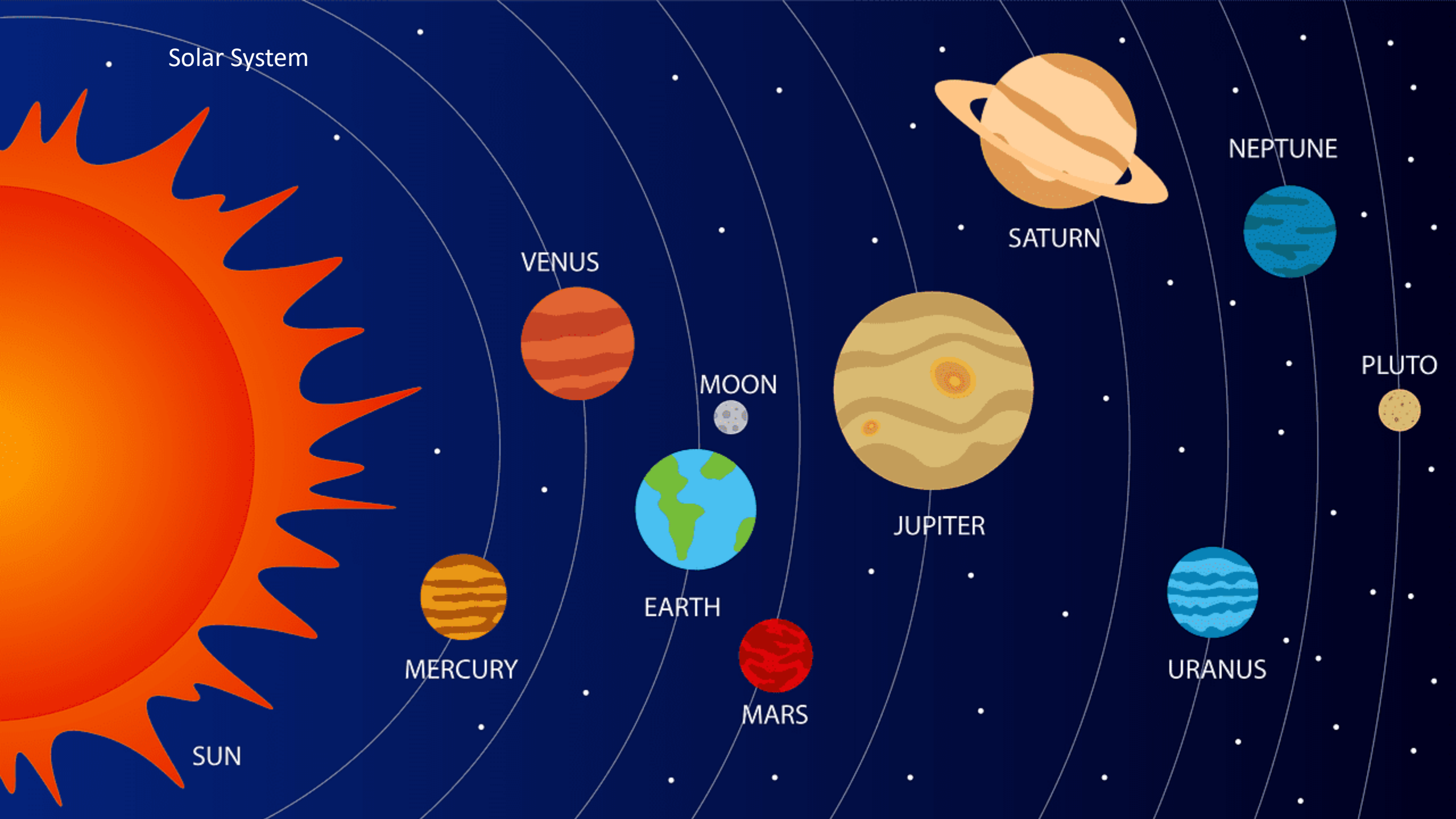


- Write on the side of the lego “Prior Knowledge”

2) Pre-Teach Vocabulary

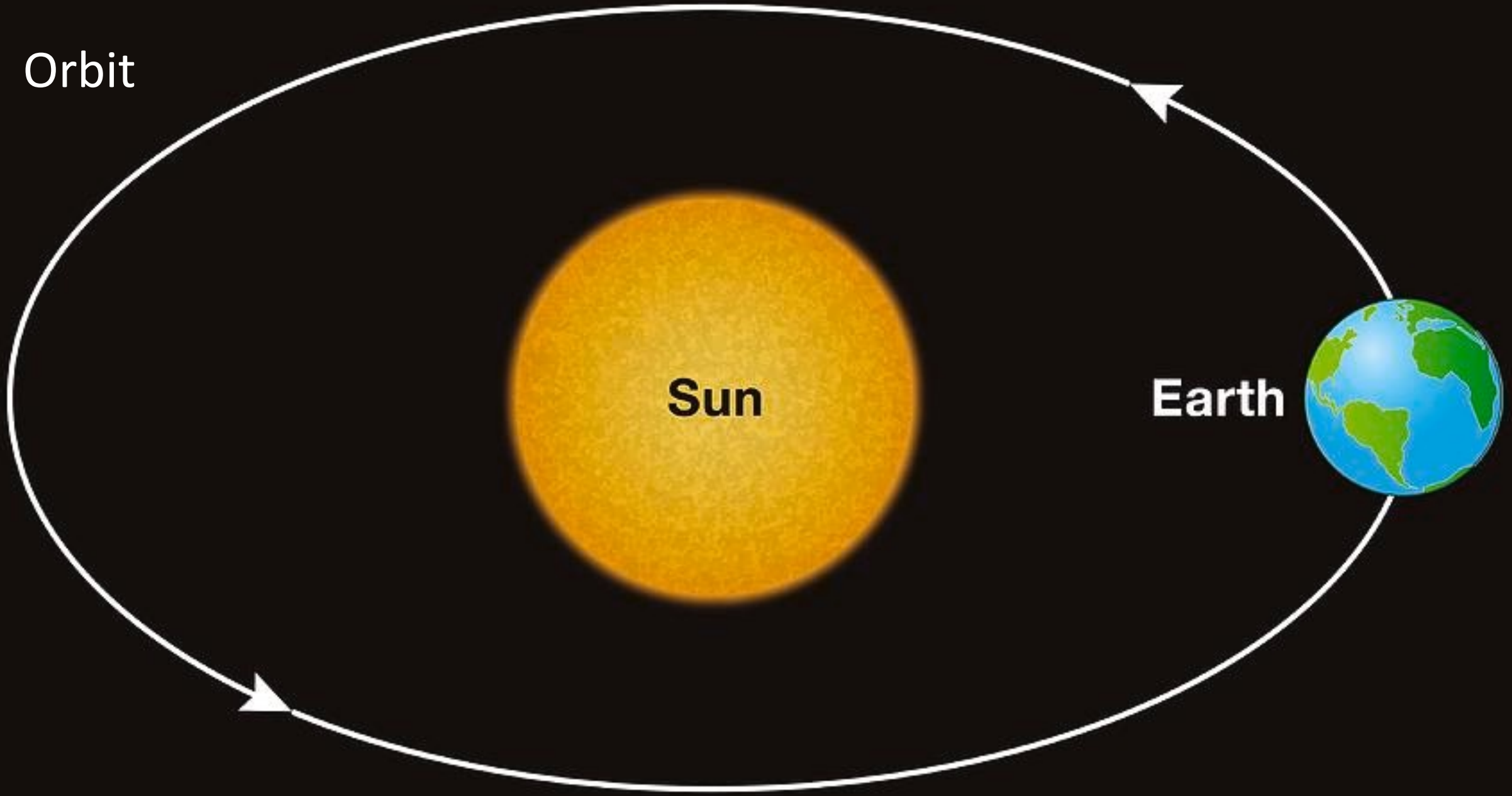
- Sometimes referred to as front-loading vocabulary, this is a strategy that we teachers don't use enough.
- Many teachers are guilty of sending students all alone down the bumpy, muddy path known as Challenging Text—a road booby-trapped with difficult vocabulary. They send them ill-prepared and then are often shocked when they lose interest, create a ruckus, or fall asleep.
- Pre-teaching vocabulary doesn't mean pulling a dozen words from the chapter and having kids look up definitions and write them out—we all know how that will go.
    - Introduce the words to kids in photos or in context with things they know and are interested in.
    - Use analogies and metaphors and invite students to create a symbol or drawing for each word.
    - Give time for small-group and whole-class discussion of the words.
    - **Not until they've done all this should the dictionaries come out. And the dictionaries will be used only to compare with those definitions they've already discovered on their own.**
- With the dozen or so words front-loaded, students are ready, with you as their guide, to tackle that challenging text.


Galaxy


Solar System
SUN
MERCURY
VENUS
EARTH
MOON
MARS
JUPITER
SATURN
URANUS
NEPTUNE
PLUTO

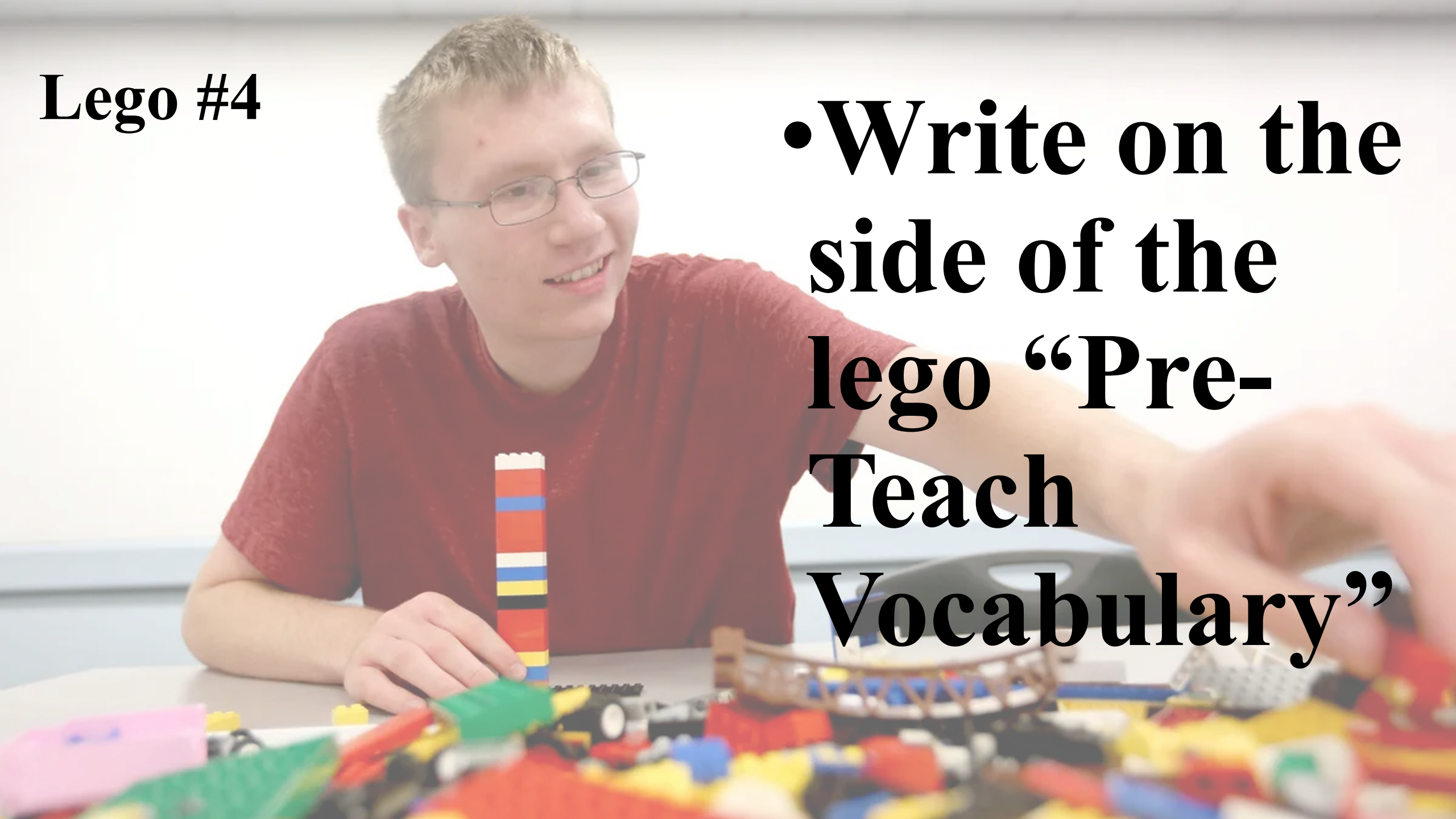
- Participant #1 will Pre-Teach Vocabulary Word **Orbit**
- Participant #2 will Pre-Teach Vocabulary Word **Equator**
- Each Participant will have 1 minute to Prep and 2 minutes to Pre-Teach Vocabulary
  - ***Introduce the words to kids in photos or in context with things they know and are interested in.***
- **Orbit**
  - In celestial mechanics, an orbit is the curved trajectory of an object such as the trajectory of a planet around a star, or of a natural satellite around a planet, or of an artificial satellite around an object or position in space such as a planet, moon, asteroid, or Lagrange point.
- **Equator**
  - An imaginary line drawn around the earth equally distant from both poles, dividing the earth into northern and southern hemispheres and constituting the parallel of latitude 0°.

Orbit




MARVEL
GUARDIANS OF THE GALAXY
FROM THE STUDIO THAT BROUGHT YOU THE AVENGERS
IN 3D REAL 3D 8.1.14 AND IMAX 3D


Equator



Lego #4

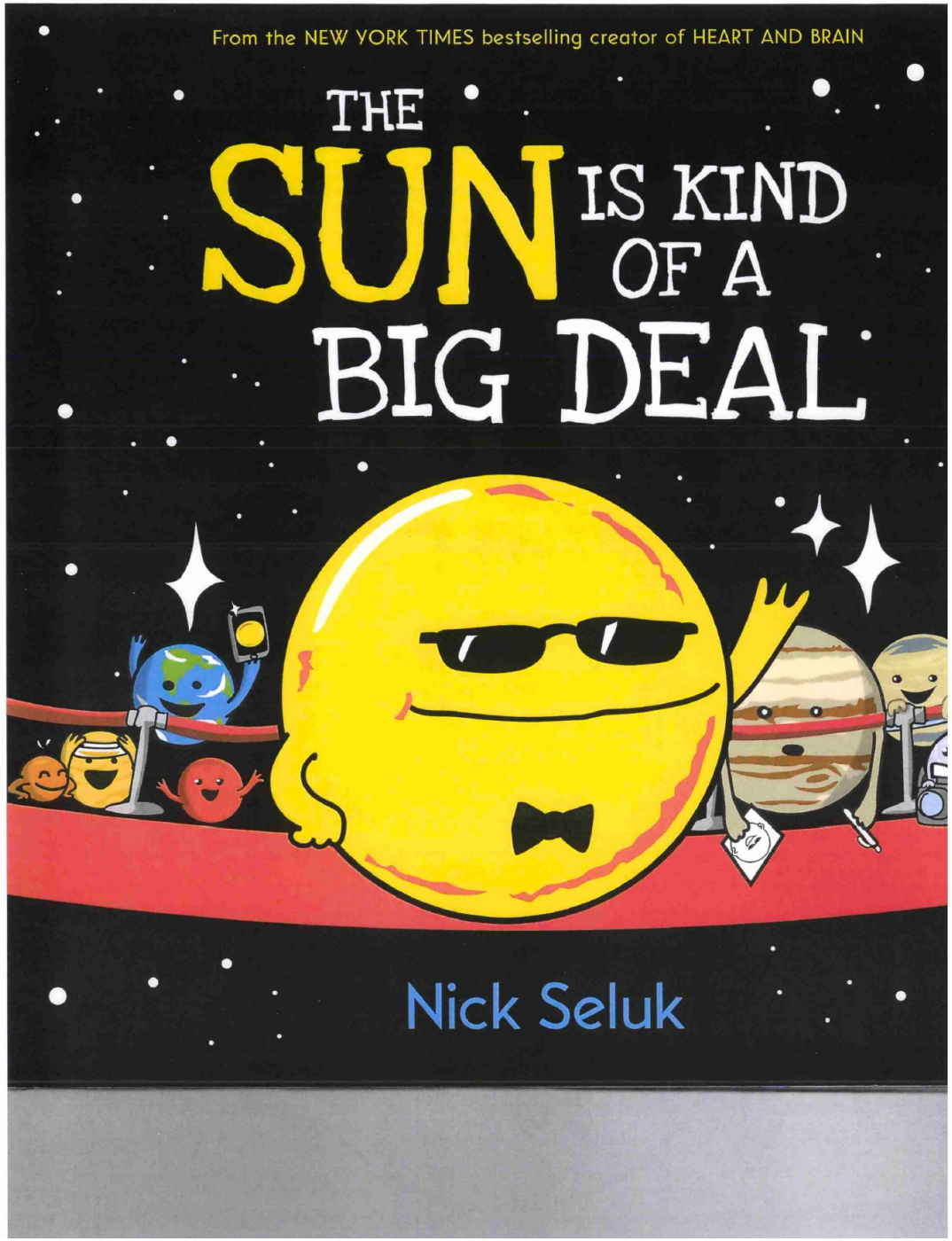
- **Write on the side of the lego “Pre-Teach Vocabulary”**

3) Show and Tell

- How many of us say that we learn best by seeing something rather than hearing about it?
- Modeling for students is a cornerstone of scaffolding.
- Have you ever interrupted someone with “Just show me!” while they were in the middle of explaining how to do something?
- **Every chance you have, show or demonstrate to students exactly what they are expected to do.**
  - Always show students the outcome or product before they do it. If a teacher assigns a persuasive essay or inquiry-based science project, a model should be presented side-by-side with a criteria chart or rubric. You can guide students through each step of the process with the model of the finished product in hand.
  - Use think alouds, which will allow you to model your thought process as you read a text, solve a problem, or design a project. Remember that children’s cognitive abilities are still in development, so opportunities for them to see developed, critical thinking are essential.

Think Alouds

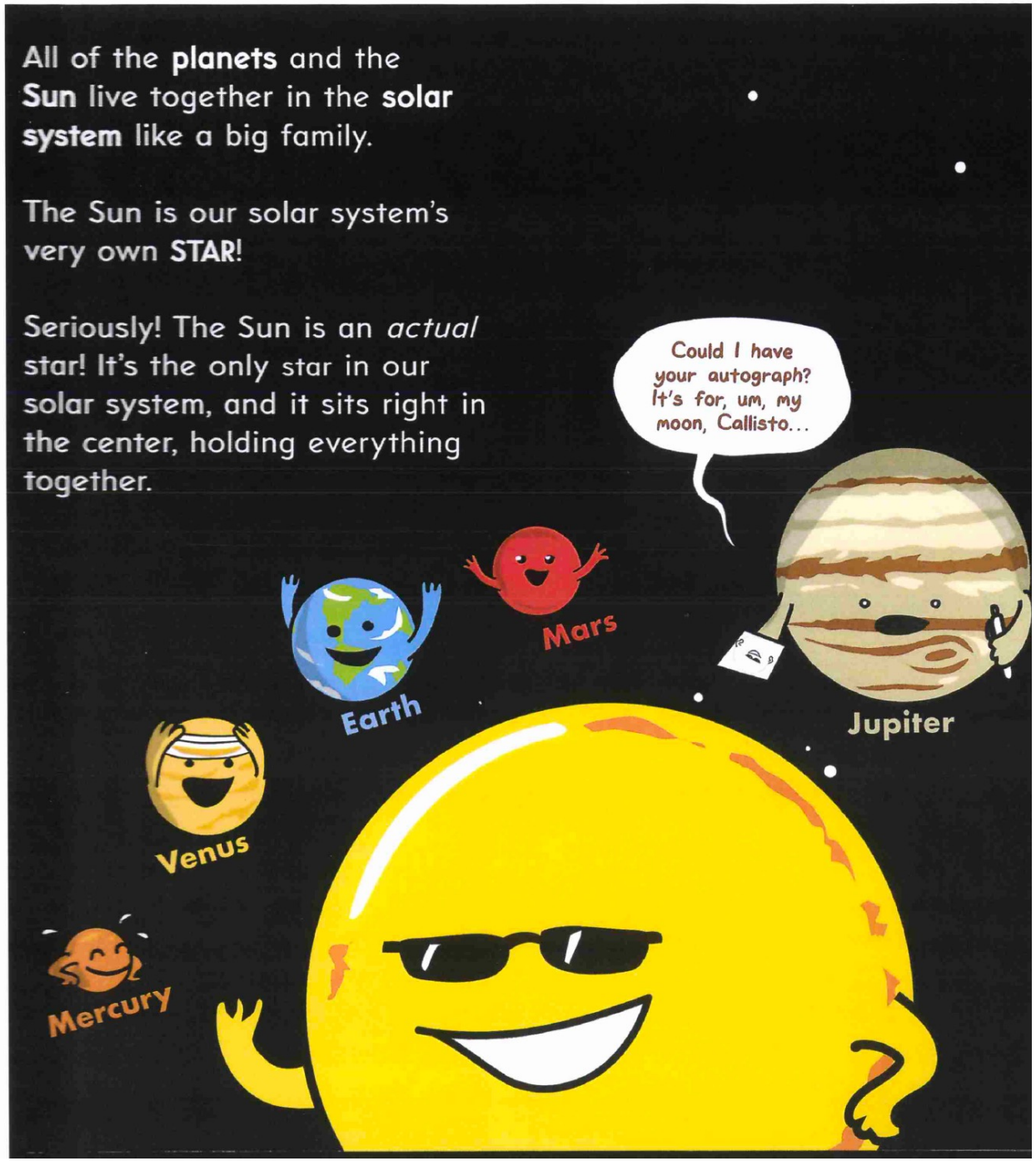
- Begin by modeling this strategy. Model your thinking as you read. Do this at points in the text that may be confusing for students (new vocabulary, unusual sentence construction). Then introduce the assigned text and discuss the purpose of the Think Aloud strategy. Then develop the set of questions to support thinking aloud (see examples below). What do I know about this topic?
  - *What do I think I will learn about this topic?*
  - *Do I understand what I just read?*
  - *Do I have a clear picture in my head about this information?*
  - *What more can I do to understand this?*
  - *What were the most important points in this reading?*
  - *What new information did I learn?*
  - *How does it fit in with what I already know?*
- Teachers should next give students opportunities to practice the technique, either in pairs, small groups or individually; and offer structured feedback to students.
- Initially, the teacher reads the selected passage aloud as the students read the same text silently. At certain points the teacher stops and "thinks aloud" answers to some of the pre-selected questions.
- Teachers should demonstrate how good readers monitor their understanding by rereading a sentence, reading ahead to clarify, and/or looking for context clues.
- Students then learn to offer answers to the questions as the teacher leads the Think Aloud strategy. As students become familiar with the Think Aloud process, they may work individually or in small groups.
- Teachers may choose to have students write down responses to the Think Aloud strategy which provides a record of learning.


From the NEW YORK TIMES bestselling creator of HEART AND BRAIN
THE SUN IS KIND OF A BIG DEAL
Nick Seluk

All of the **planets** and the **Sun** live together in the **solar system** like a big family.

The Sun is our solar system's very own **STAR**!

Seriously! The Sun is an *actual* star! It's the only star in our solar system, and it sits right in the center, holding everything together.



SO, WHAT'S IN THE SOLAR SYSTEM BESIDES THE SUN AND THE PLANETS?

* **Dwarf Planets** — five rocky bodies that are smaller than planets
* **Asteroids** — small, rocky objects that move around between Mars and Jupiter in the "asteroid belt"
* **Meteors** — streaks of light created when pieces of space rock or metal speed into Earth's atmosphere (If you see a shooting star, it's actually a meteor!)
* **Comets** — icy rocks that shoot through space and leave a trail of gas and dust
* Aliens — okay, maybe not, but we're always looking for them!

Saturn

Uranus

Neptune

OH HEY, GUESS WHAT?

Our solar system is just one of MANY solar systems that exist. A **galaxy** is a group made up of billions of solar systems. Our galaxy is called the Milky Way. There are BILLIONS of galaxies out there, and together they make up the universe. Can *you* count to a billion?

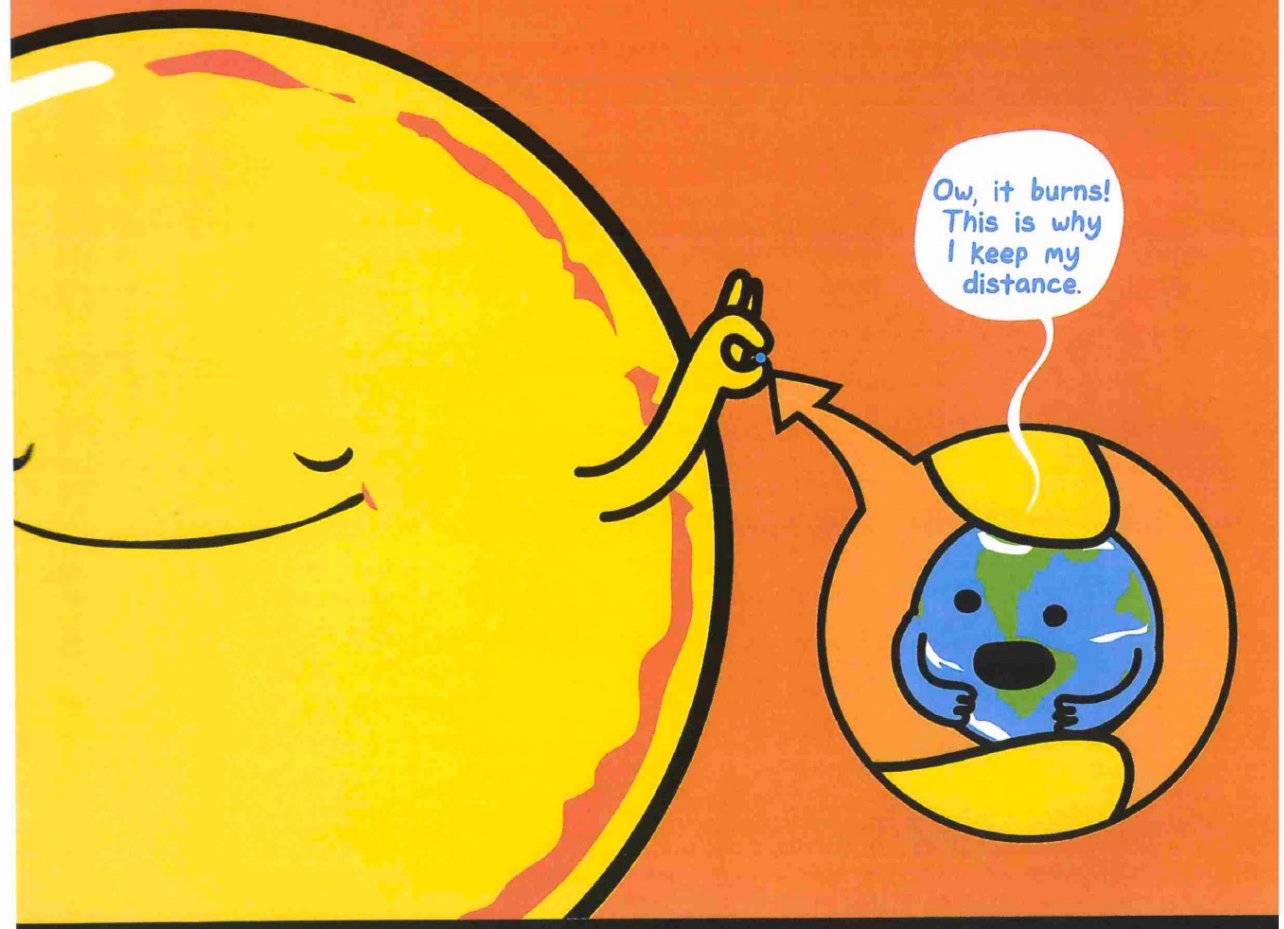
The Sun is the biggest thing
in the solar system.

It's even bigger than Earth!

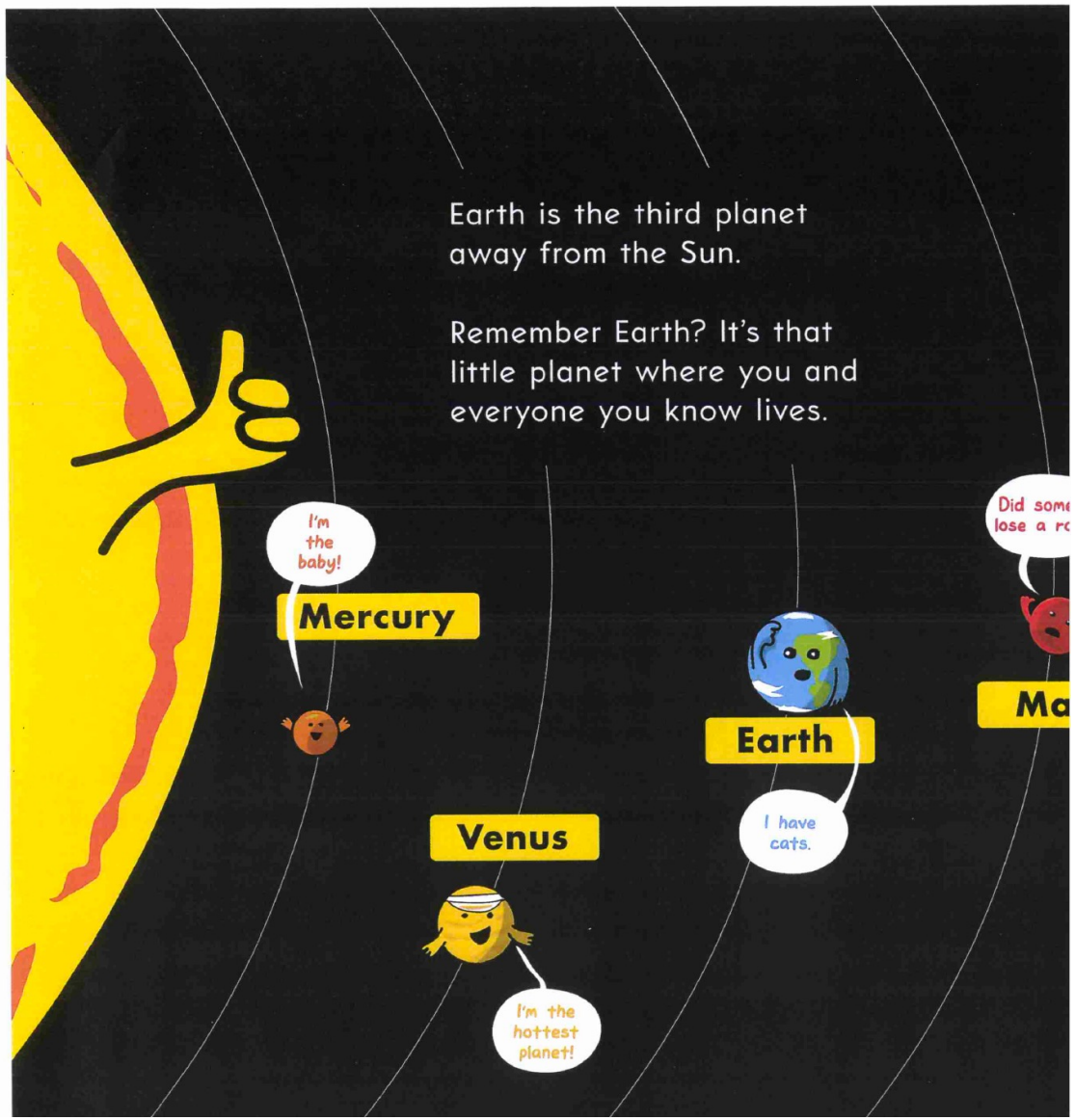
Way bigger.

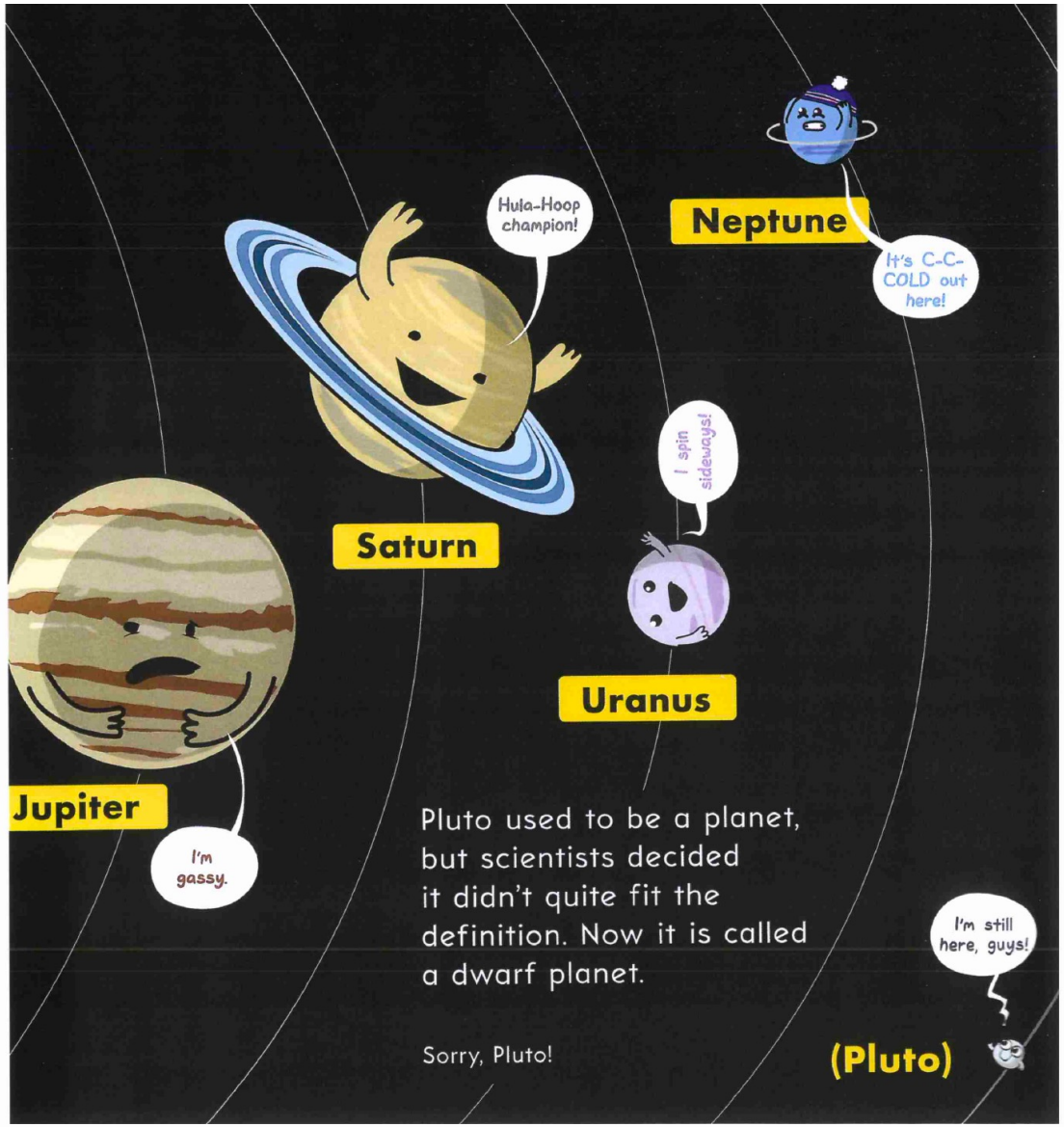
Way, way bigger.

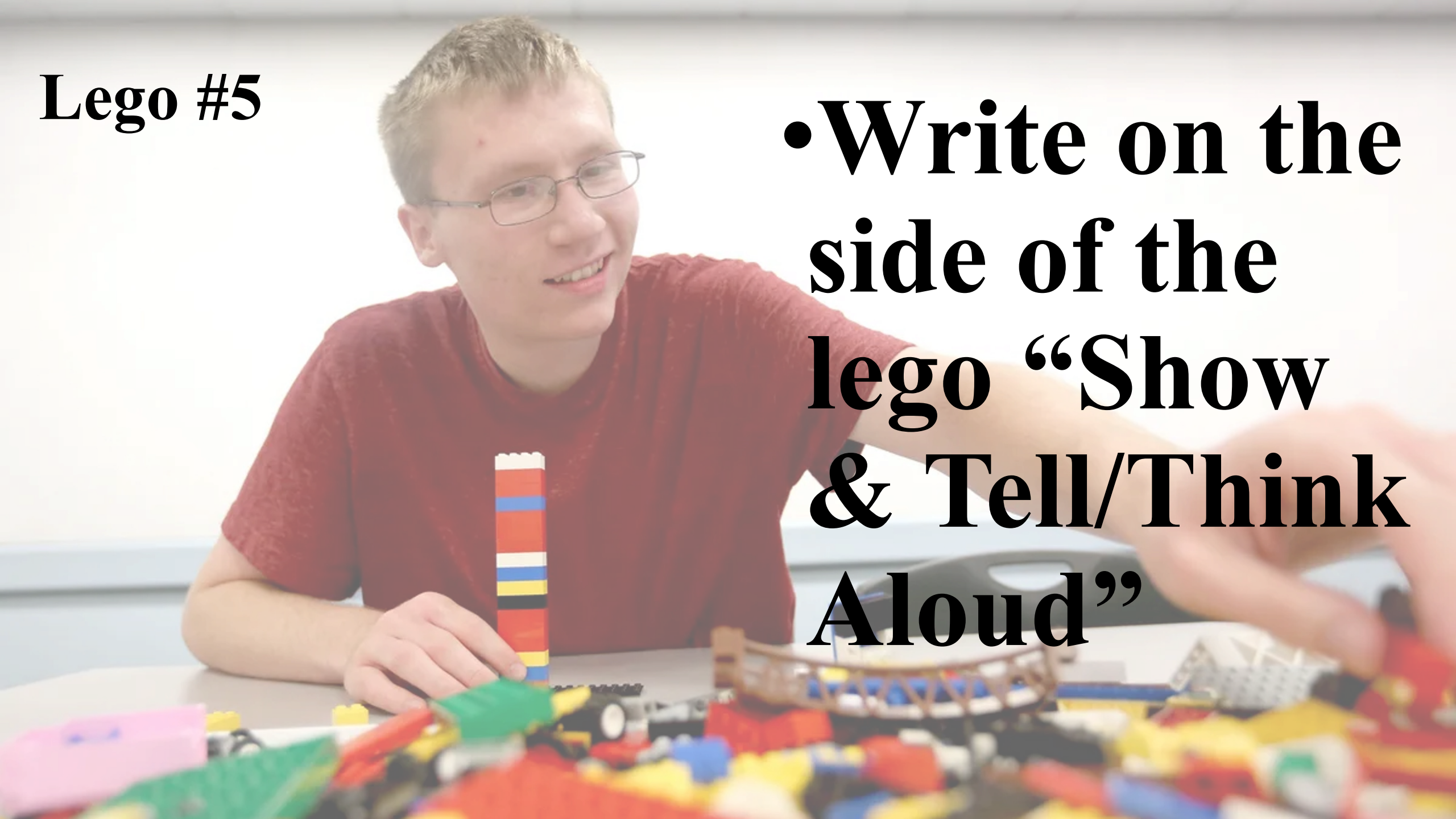
Like, over a million times bigger!



- REVIEW: Initially, the teacher reads the selected passage aloud as the students read the same text silently. At certain points the teacher stops and "thinks aloud" answers to some of the pre-selected questions. Do this at points in the text that may be confusing for students (new vocabulary, unusual sentence construction).
- Participant #3 will model Think Aloud to Participants #1 & #2
- Participant #3 will have 1 minute to prep
  - *Do I understand what I just read?*
  - *Do I have a clear picture in my head about this information?*
  - *What more can I do to understand this?*
  - *What were the most important points in this reading?*
  - *What new information did I learn?*
  - *How does it fit in with what I already know?*
- REMEMBER: Teachers should next give students opportunities to practice the technique, either in pairs, small groups or individually; and offer structured feedback to students.


Earth is the third planet away from the Sun.
Remember Earth? It's that little planet where you and everyone you know lives.
I'm the baby!
Mercury
Venus
I'm the hottest planet!
Earth
I have cats.
Did some
lose a ro
Ma


Hula-Hoop champion!
Saturn
Neptune
It's C-C-COLD out here!
I spin sideways!
Uranus
Jupiter
I'm gassy.
Pluto used to be a planet, but scientists decided it didn't quite fit the definition. Now it is called a dwarf planet.
Sorry, Pluto!
I'm still here, guys!
(Pluto)

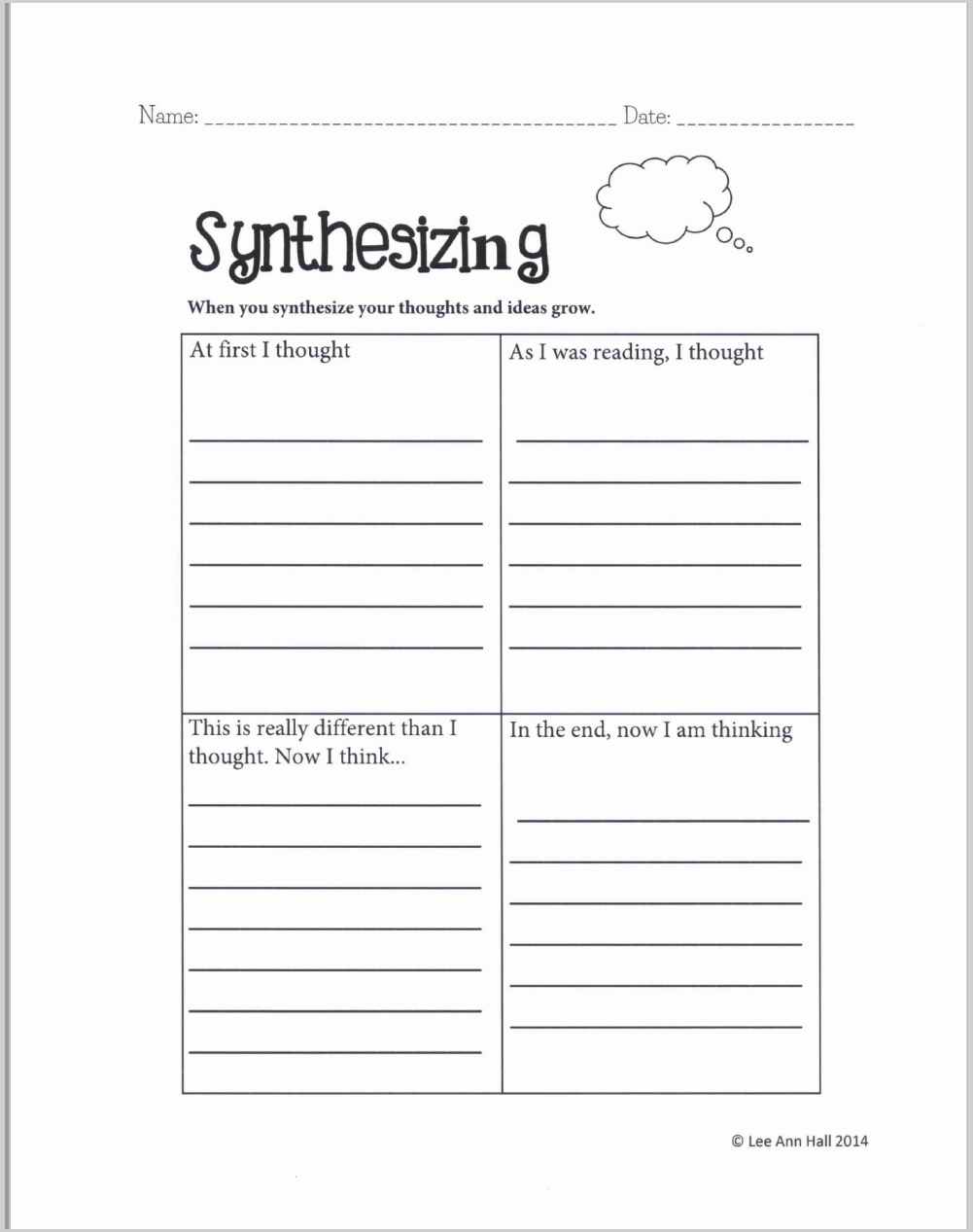


Lego #5

- Write on the side of the lego “Show & Tell/Think Aloud”

3) Use Visual Aids

- Graphic organizers, pictures, and charts can all serve as scaffolding tools.
- Graphic organizers are very specific in that they help kids visually represent their ideas, organize information, and grasp concepts such as sequencing and cause and effect.
- **A graphic organizer shouldn't be The Product but rather a scaffolding tool that helps guide and shape students' thinking.**
- Some students can dive right into discussing, or writing an essay, or synthesizing several different hypotheses, without using a graphic organizer of some sort, but many of our students benefit from using one with a difficult reading or challenging new information.
- Think of graphic organizers as training wheels—they're temporary and meant to be removed.



Name: _____ Date: _____

Synthesizing

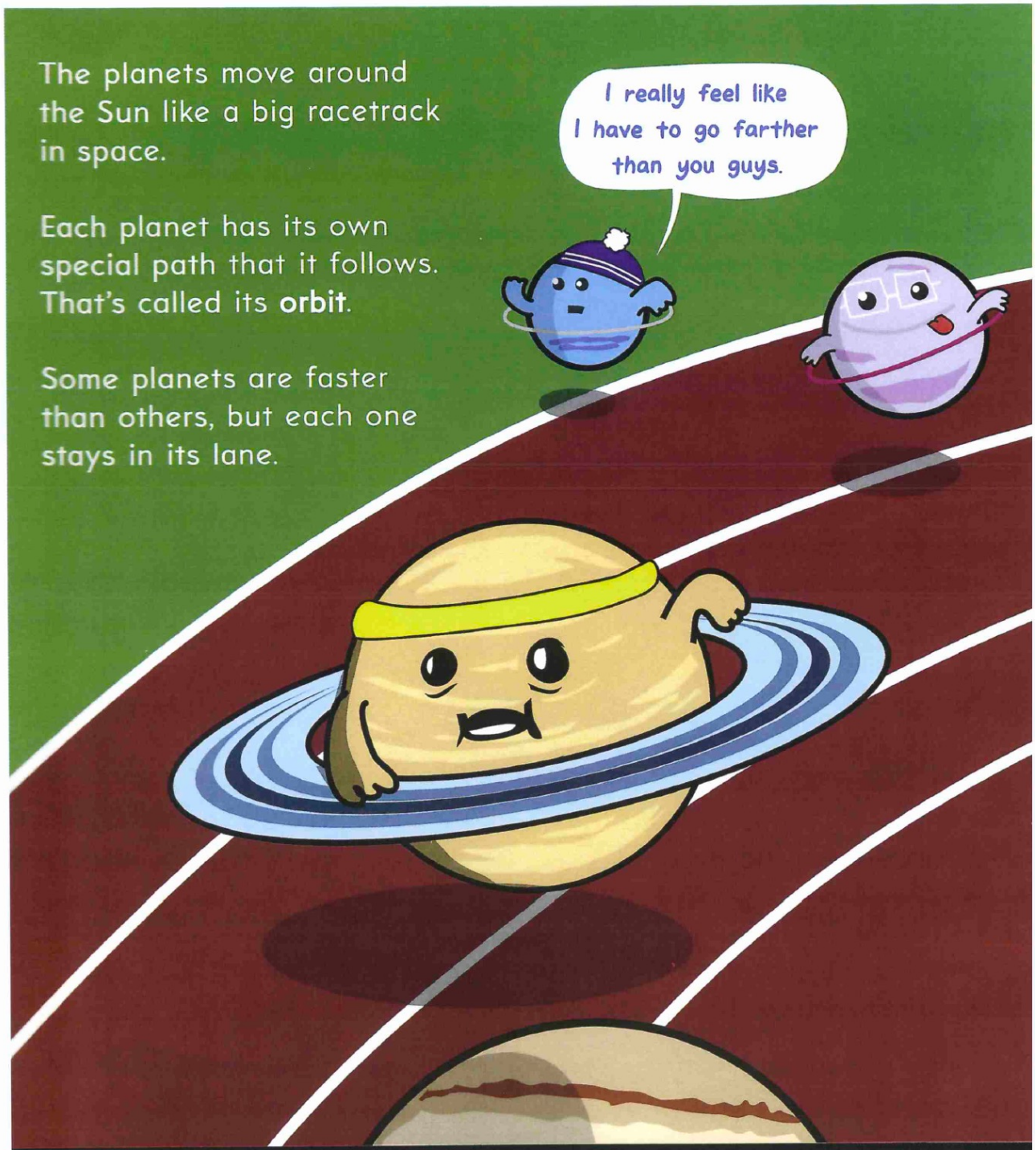
When you synthesize your thoughts and ideas grow.

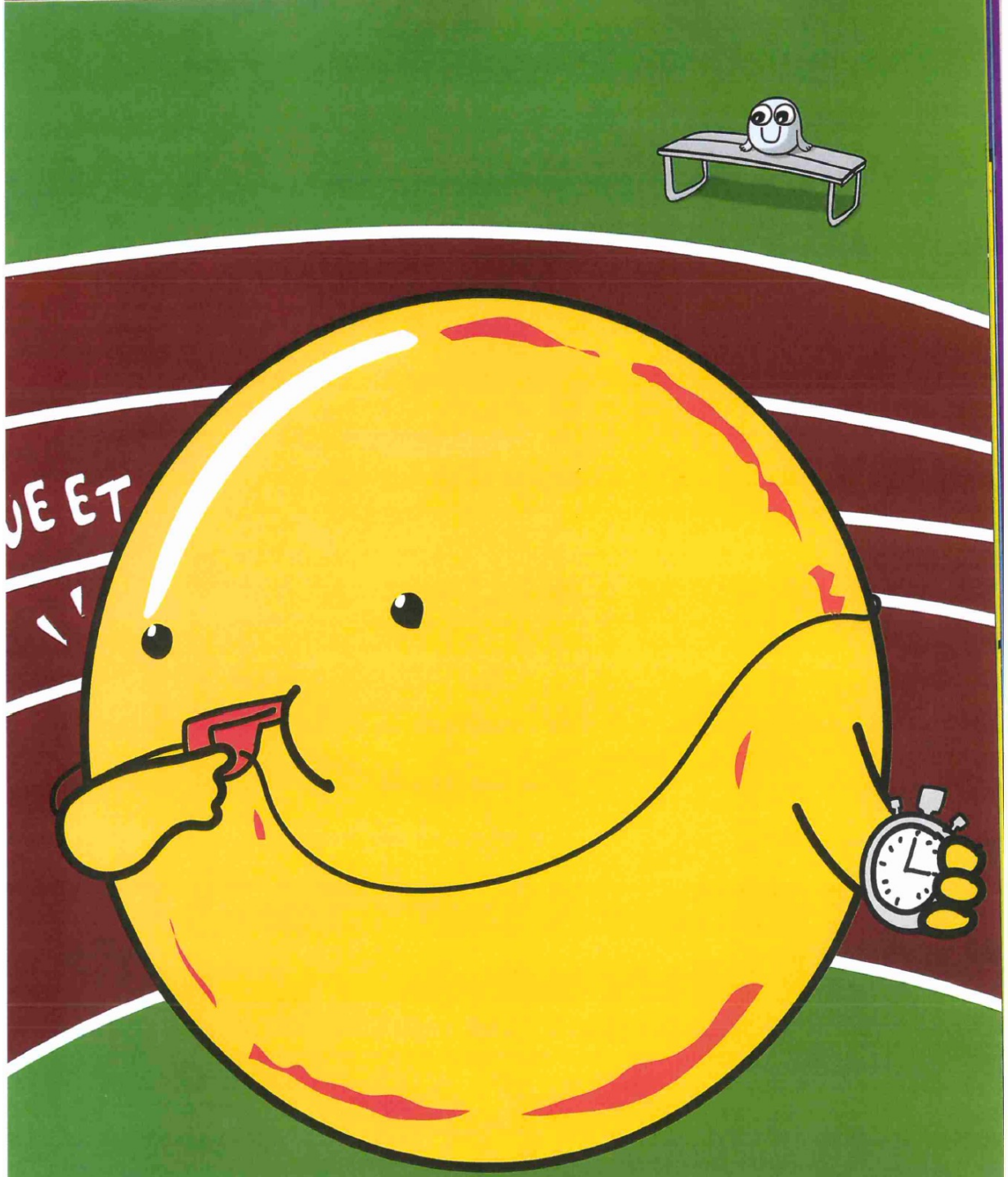
At first I thought	As I was reading, I thought
This is really different than I thought. Now I think...	In the end, now I am thinking

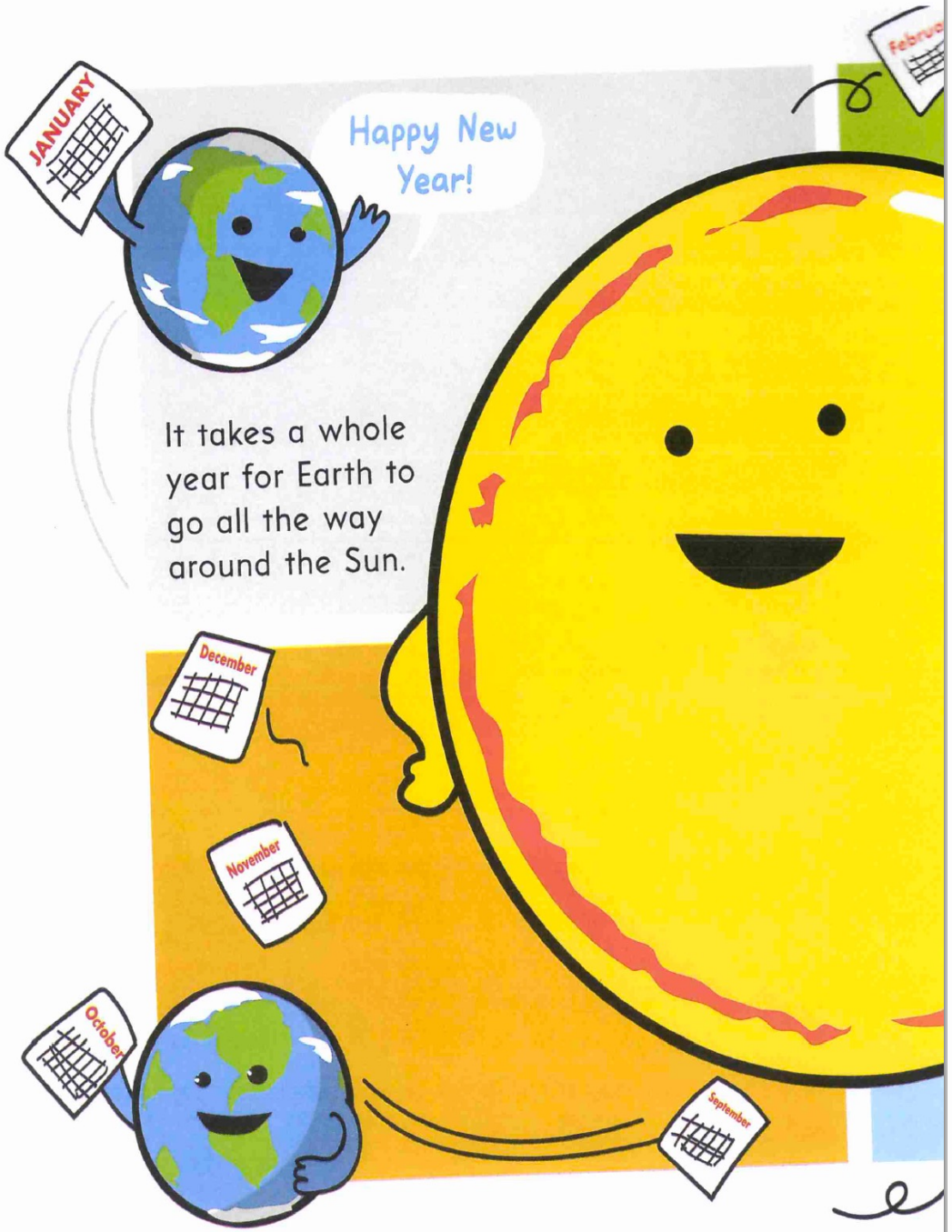
The planets move around the Sun like a big racetrack in space.

Each planet has its own special path that it follows. That's called its **orbit**.

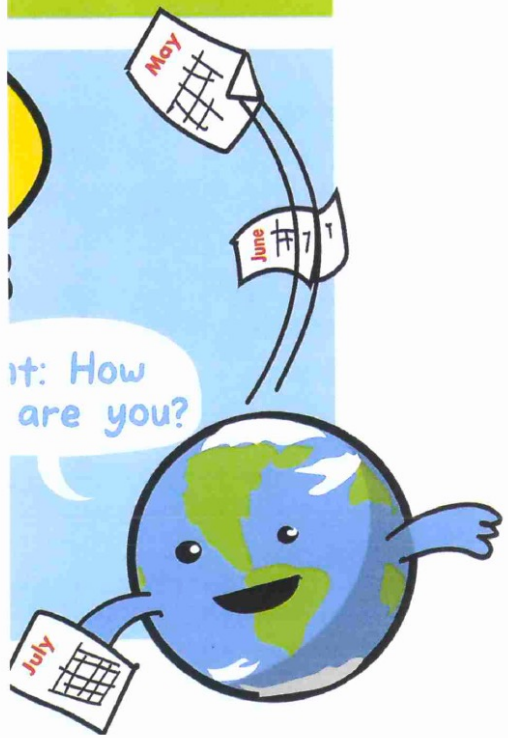
Some planets are faster than others, but each one stays in its lane.







Do you know how many times you have been around the Sun?



SO WHAT DOES THE MOON DO ALL YEAR LONG?

While Earth is going around the Sun, the **moon** is spinning around Earth! The moon goes around Earth twelve or thirteen times in one year. That's about once a month. Depending on where the moon is in its **cycle**, we might only see part of it. The rest of the moon is in shadow. When we see the whole thing, it's called a full moon.

Name: _____ Date: _____

Synthesizing

When you synthesize your thoughts and ideas grow.

At first I thought	As I was reading, I thought
This is really different than I thought. Now I think...	In the end, now I am thinking

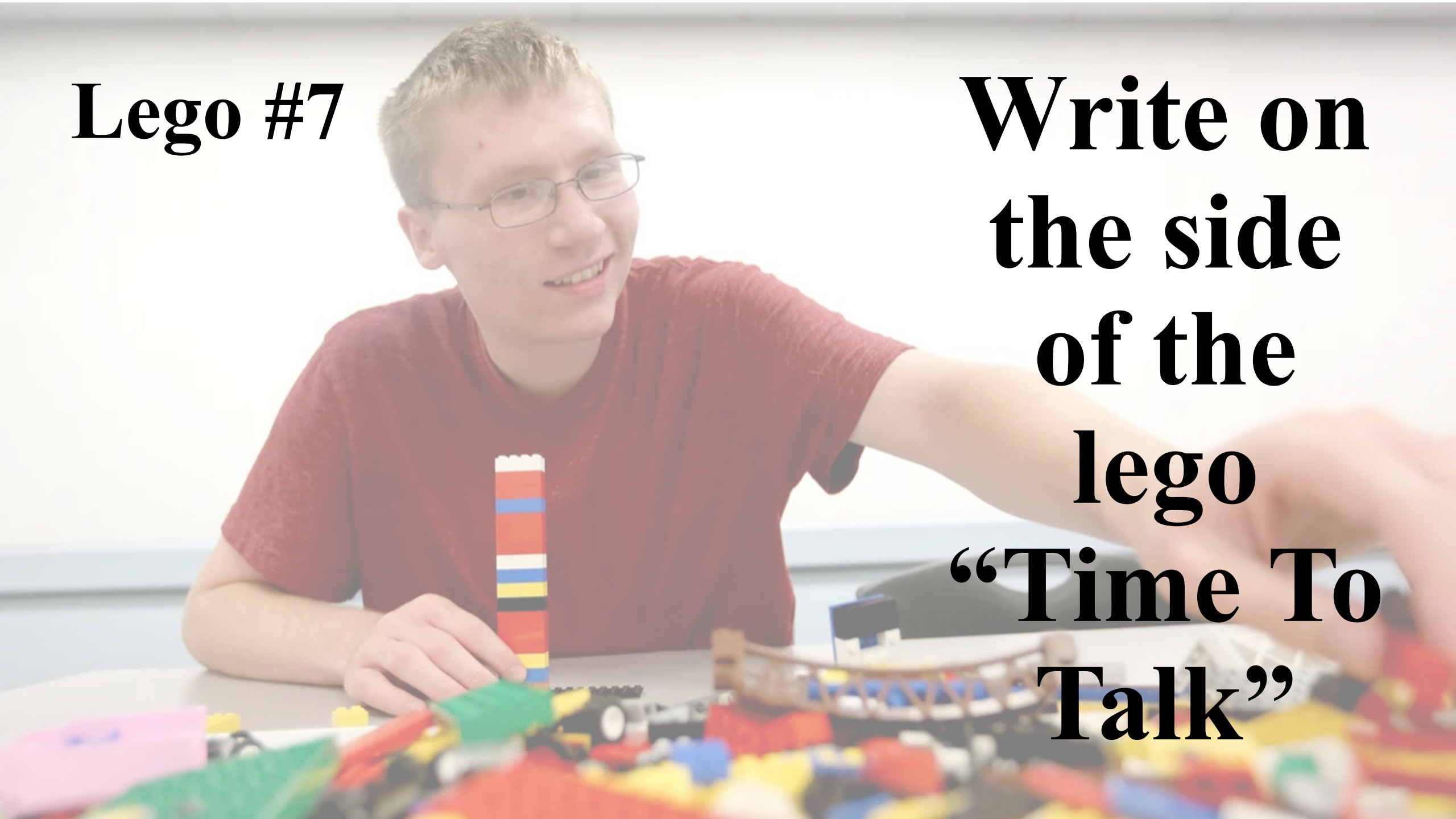

Lego #6
lego “Visual Aids”

5) Give Time To Talk

- **All learners need time to process new ideas and information**.
- They also **need time to verbally make sense of and articulate their learning** with the community of learners who are engaged in the same experience and journey.
- As we all know, structured discussions really work best with children regardless of their level of maturation.
- If you aren't weaving in think-pair-share, turn-and-talk, triad teams, or some other structured talking time throughout the lesson, you should begin including this crucial strategy on a regular basis.

Turn & Talk

- Turn and talk about 2 different jobs the sun has?
- Note: While students talk, teacher circulates, listening to what students are discussing and monitoring for understanding. After they are done discussing, teacher can ask to share.

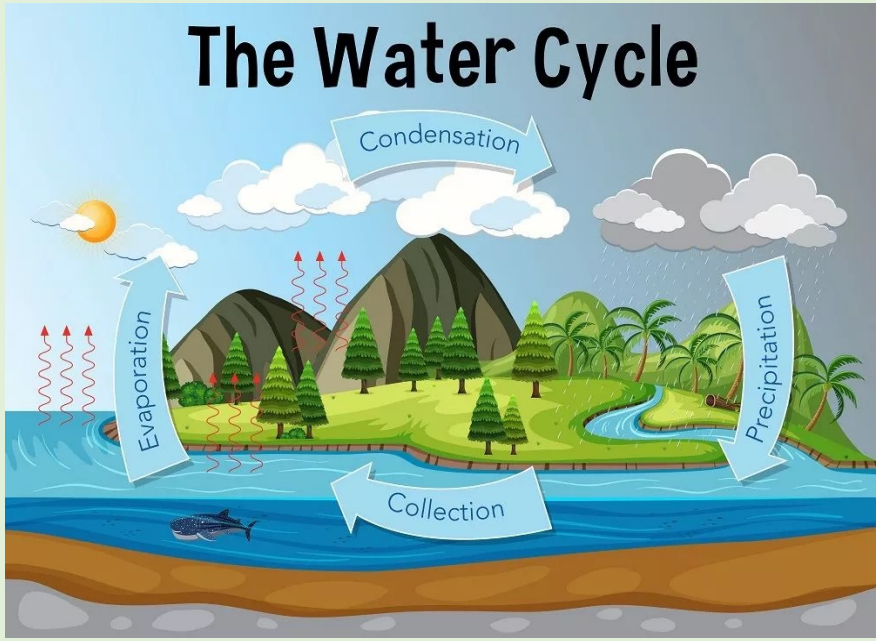

Lego #7
Write on the side of the lego “Time To Talk”

6) Pause, Ask Questions, Pause, Review (PAQPR)

- This is a wonderful way to check for understanding while students read a chunk of difficult text or learn a new concept or content.
- Here's how this strategy works:
  - **Share a new idea from discussion or the reading, then pause (providing think time), and then ask a strategic question, pausing again.**
- You need to design the questions ahead of time, making sure they're specific, guiding, and open-ended.
- (Even great questions fail if we don't give think time for responses, so hold out during that Uncomfortable Silence.)
- Keep kids engaged as active listeners by calling on someone to give the gist of what was just discussed, discovered, or questioned.
- If the class seems stuck on the questions, provide an opportunity for students to discuss in pairs.

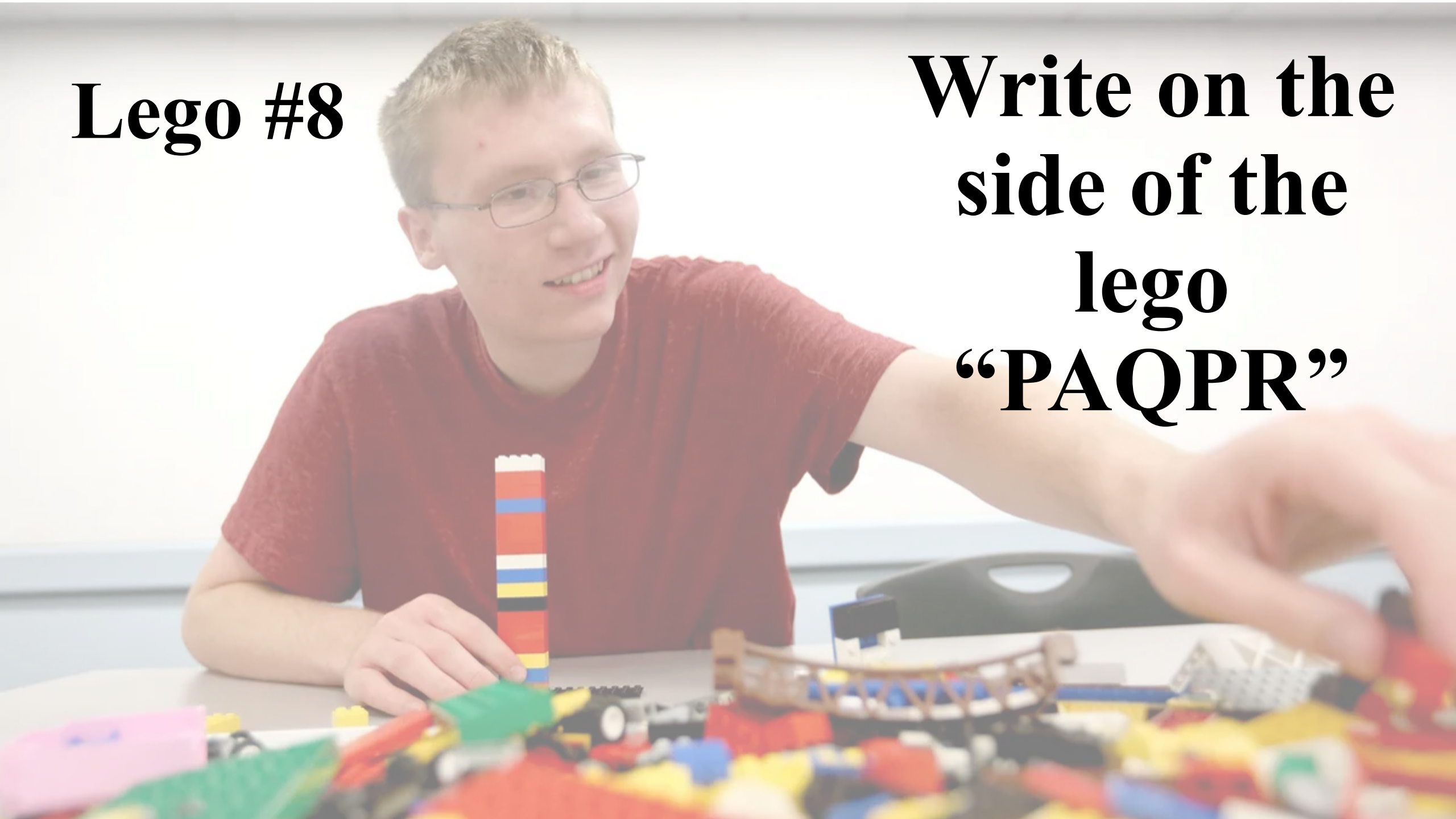
Pause, Answer Questions, Pause, Review (PAQPR)

- The Water Cycle: The water cycle is the continuous process by which water moves from the Earth's surface to the atmosphere and back again.
  - Condensation
  - Precipitation
  - Evaporation



- Let's Practice:
  1. What is the role of the sun in the water cycle?
  2. What is the process called when water changes from a liquid to a gas?
  3. What is the process called when water vapor changes back into a liquid?

Lego #8



Write on the side of the lego “PAQPR”

Learning Objectives

1. **Today we will review the research of Hermann Ebbinghaus and its role in the Science of Learning.**
2. **Today we will learn 6 Scaffolding strategies to use in your school/classroom.**

Scaffolding in Education

- Scaffolding in education, is a teachers' strategy for providing assistance while students master new skills and concepts.

6 Scaffolding Strategies

1) Activate Prior Knowledge

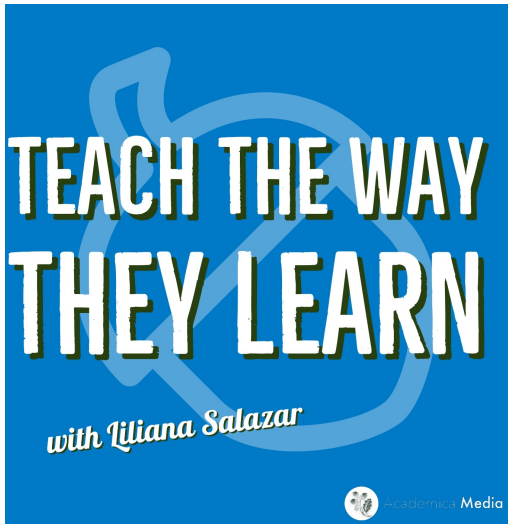
2) Pre-teach Vocabulary

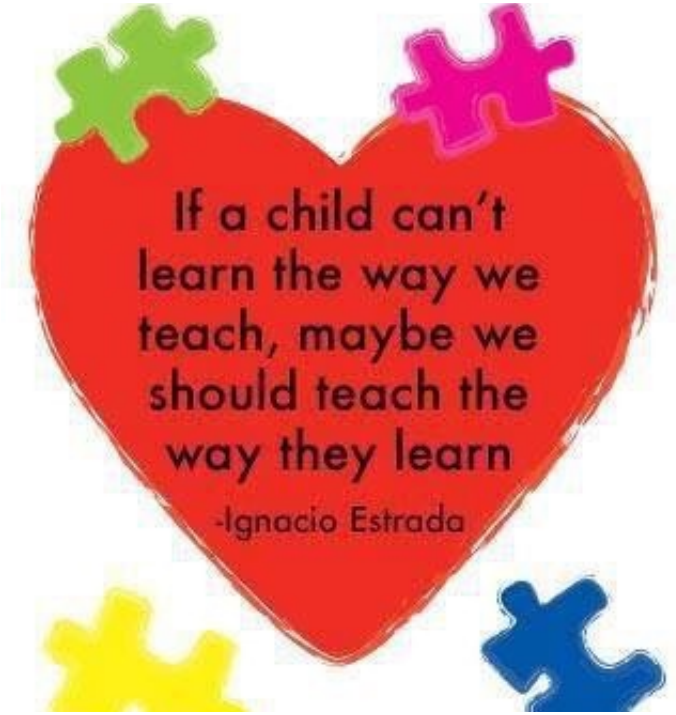
3) Show & Tell (Think Aloud)

4)Visual Aids

5) Give Time To Talk

6) Pause, Ask Questions, Pause, Review (PAQPR)


TEACH THE WAY
THEY LEARN
with Liliana Salazar
Academica Media


If a child can't learn the way we teach, maybe we should teach the way they learn
-Ignacio Estrada

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RAFFLE