Community Math Night Educator Training Session 1

March 16, 2021

West Virginia

IES Institute of Education Sciences

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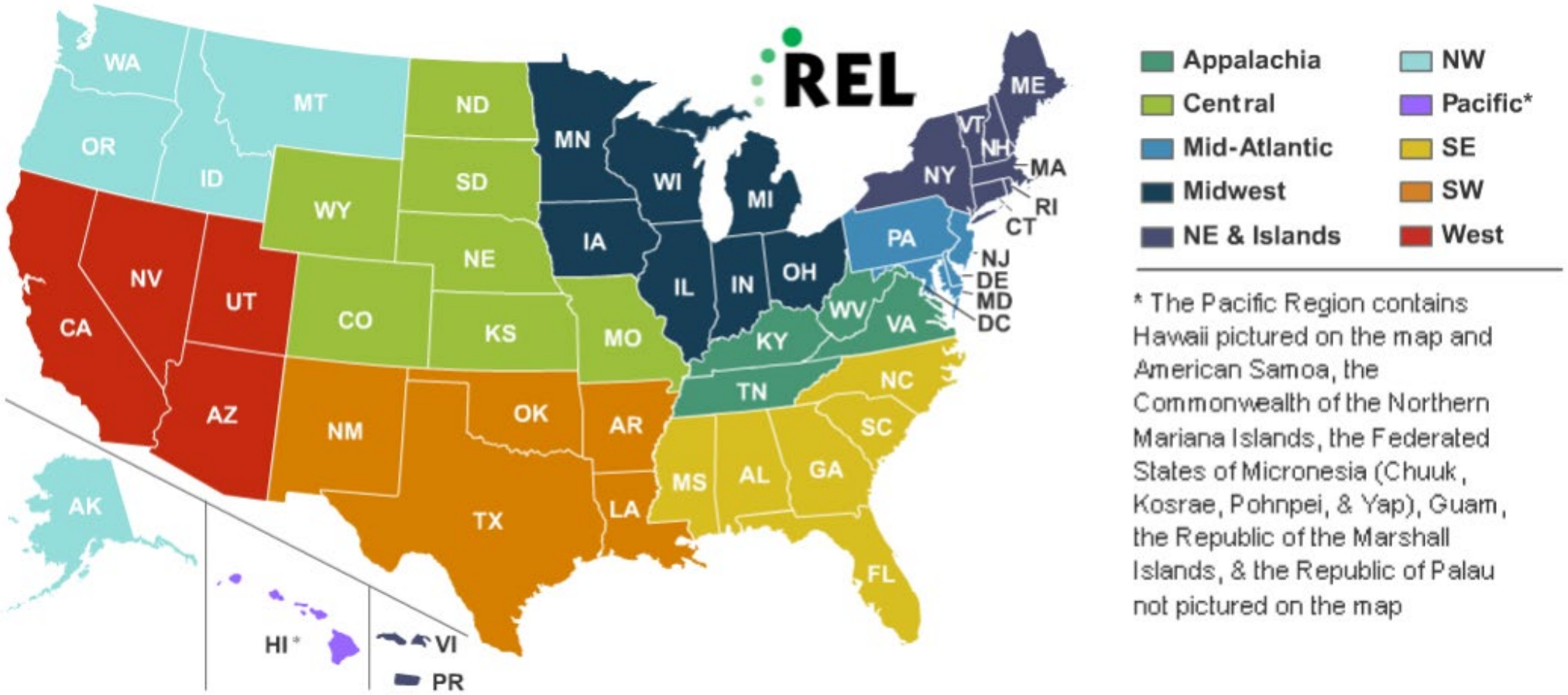


The **10 RELs** work in partnership with stakeholders to **support a more evidence-based education system.**

Administered by the U.S. Department of Education, Institute of Education Sciences (IES)

Find us on the web! **https://ies.ed.gov/ncee/edlabs/regions/appalachia/**

About WVFEC

The West Virginia Family Engagement Center helps families participate in their child's learning both inside and outside of school through SEAMless Family Engagement.

WVFEC is led and operated by
The EdVenture Group, Inc., a nonprofit education leader based in Morgantown, WV.

theEdVenturegroup

Today's goals

- Participants will **review** and **practice Community Math Night activities** and discuss considerations for implementing the activities in their schools.

Agenda

Time	Agenda item
10 min	Welcome and introductions
5 min	Community Math Night overview
10 min	Mindsets and Math presentation
10 min	Introduction to math station activities
35 min	Geometry station activities
35 min	Operations and Algebraic Thinking station activities
10 min	Wrap-up

Icebreaker

- Share your name, position, and school and a three-word strategy for family engagement.
- For example: “Welcome all volunteers.”

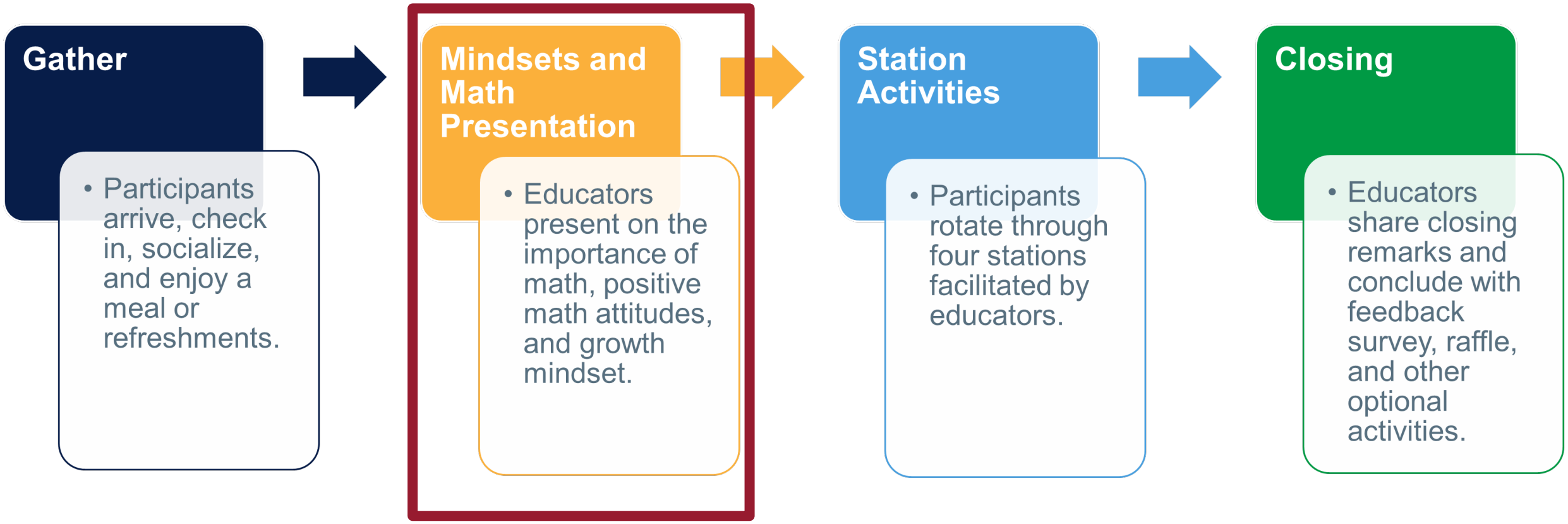
Community Math Night Overview

Math

Family

Mindset

Community Math Night components



Mindsets and Math Presentation

To consider

Consider the Mindsets and Math presentation as a learner and facilitator.

- How will family members engage with or react to this information?
- Is there anything that you think will be confusing or unclear for families in your community?

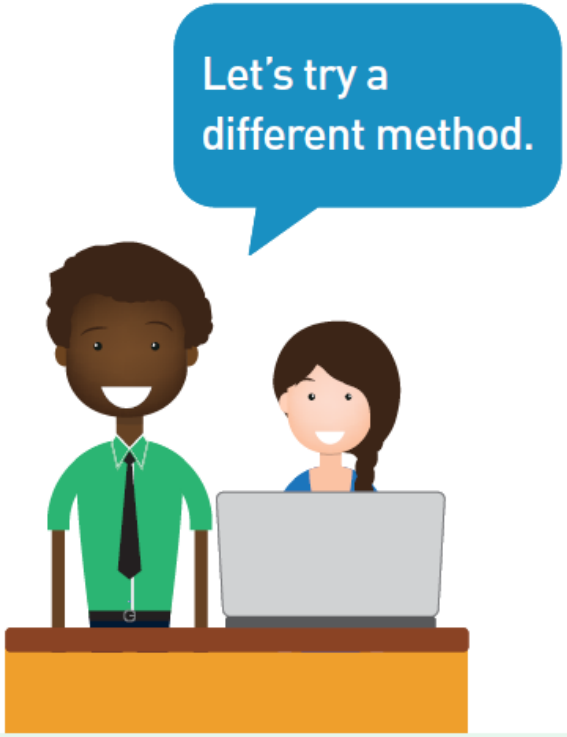
- What are the logistical considerations for presenting this information (pre-recorded, allow for questions, PA and projector, etc.)?
- Do you have anyone in mind to lead this presentation at your math night?

Why math?

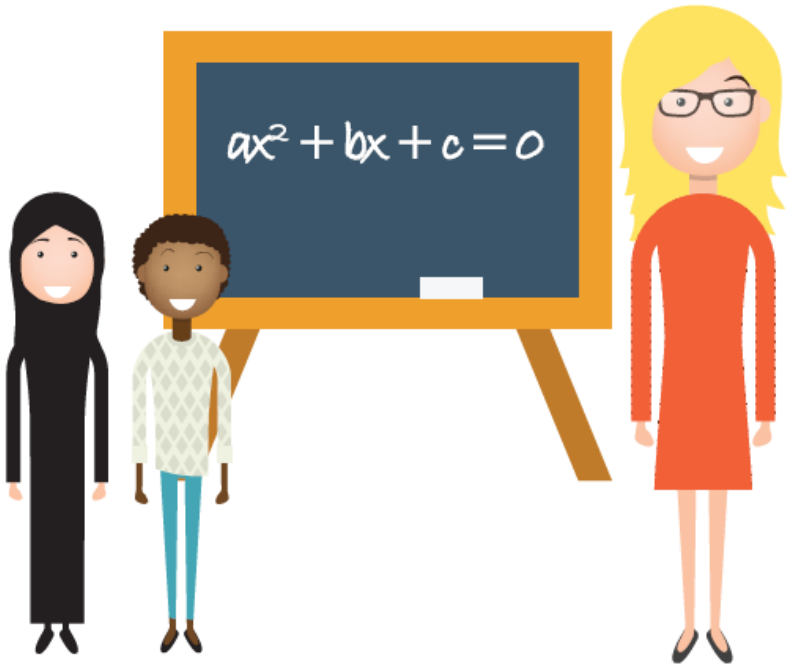
For full infographic and references see: https://ies.ed.gov/ncee/edlabs/infographics/pdf/REL_AP_Supporting_Your_Child_in_Developing_Math_Skills_for_Future_Success.pdf

We can all support math learning

praising effort and modeling positive math attitudes.



encouraging children to seek help and try new strategies when they are stuck.



confronting stereotypes about who is good at math.

For full infographic and references see: https://ies.ed.gov/ncee/edlabs/infographics/pdf/REL_AP_Supporting_Your_Child_in_Developing_Math_Skills_for_Future_Success.pdf

Math attitudes

Adult attitudes toward math can influence a child's math achievement.

- Multiple studies suggest that **adults' reactions** to a student's work **will impact the student's achievement and attitudes** toward the subject.
- Students may feel you have **low expectations** for them, which **can lead to lower motivation and lower expectations** for their own success in math.

(Blackwell et al., 2007)

Math mindset matters

Fixed Mindset

The belief that people are born with the abilities they have and there is not much you can do to change it.

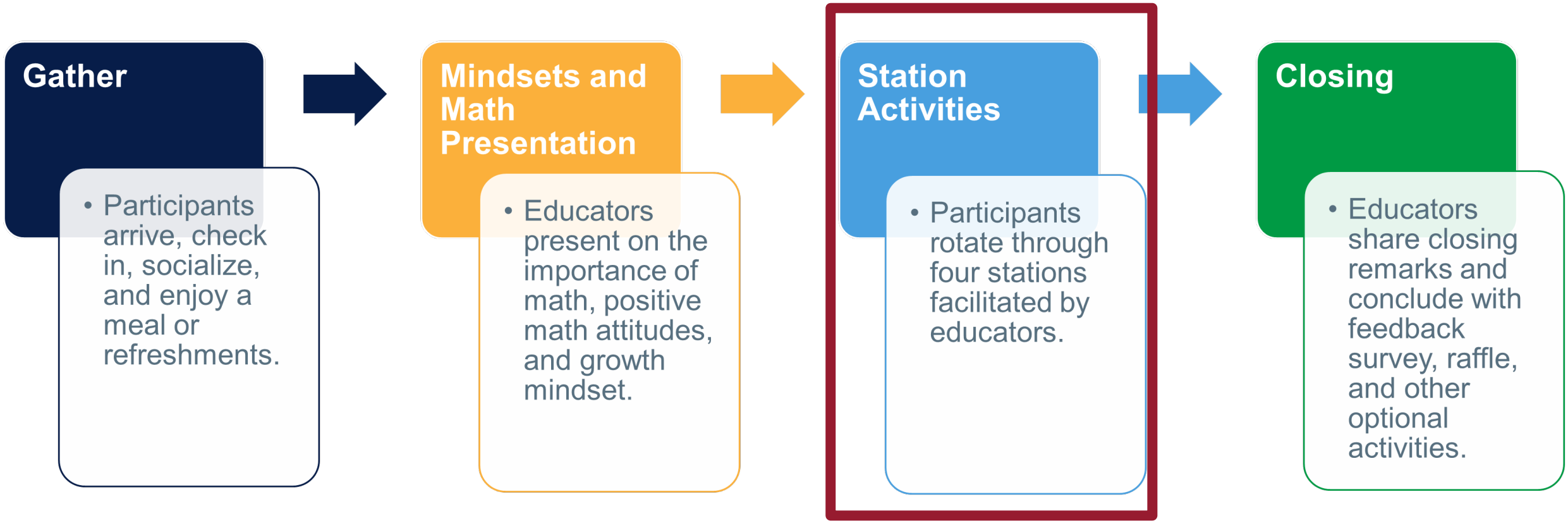
Growth Mindset

The belief that people can increase their abilities through hard work and persistence. You can work your brain like a muscle.

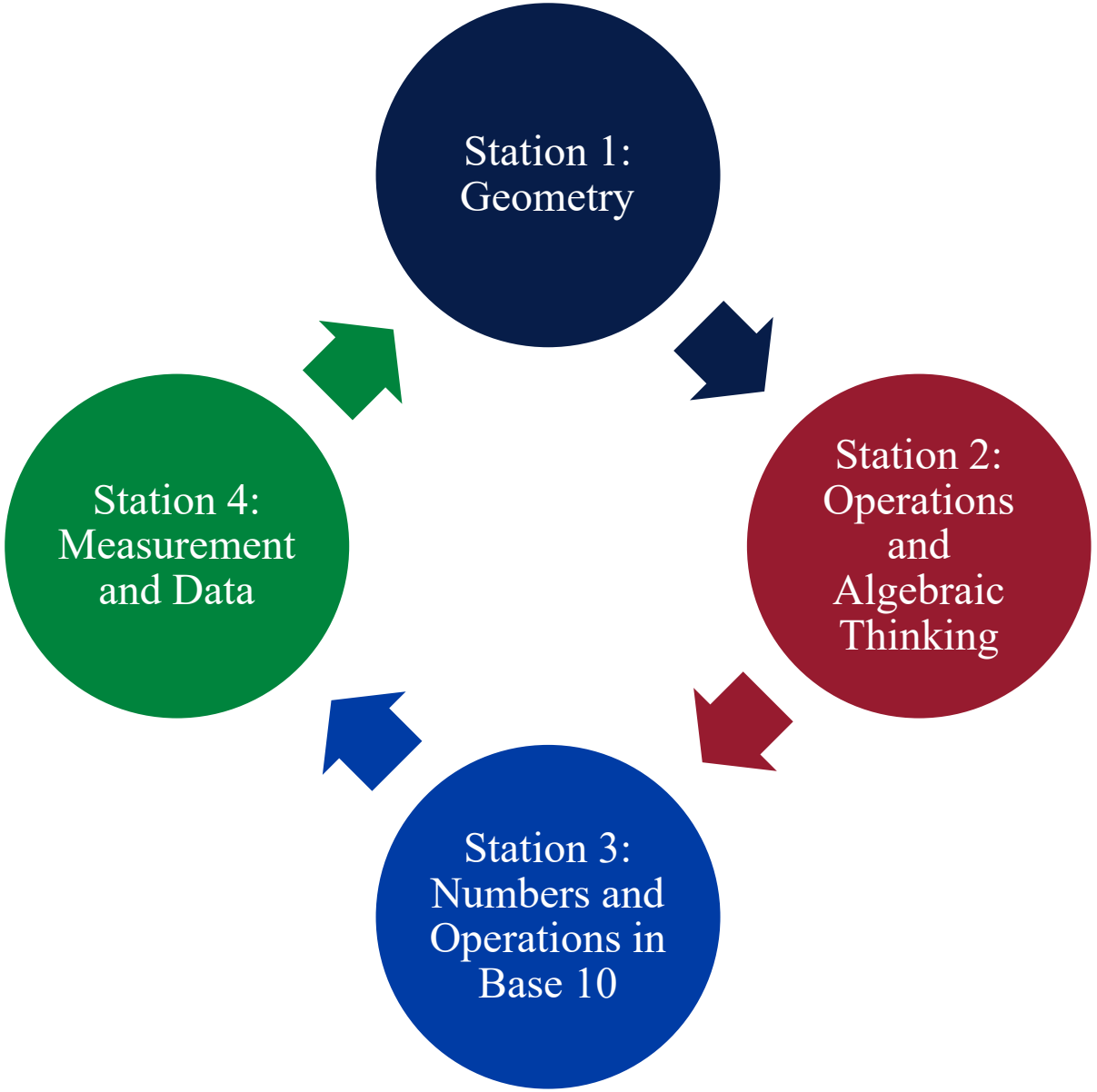
(Dweck, 2006)

Introduction to Math Station Activities

Community Math Night components



Station rotation



Facilitator guide for each activity

Activity 1a: Fill the Shapes

Goal

Families use pattern blocks to compose and decompose shapes and make composite shapes.

Recommended grade levels

Kindergarten through grade 1

Activity instructions

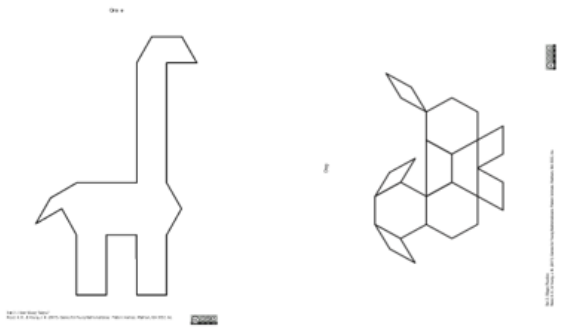
1. Select an outline. Easier outlines are scaffolded with the inside component shapes drawn, while more challenging outlines have no inside component shapes drawn.
2. For fun, take the same outline as someone else and see how you can fill it out differently.

Materials in toolkit

- Instructions and family prompts
- Printed outlines to be filled in with blocks
- Geometry glossary

Materials to gather

- A container of pattern blocks



Family prompts

- What shape is this? (Point to any of the pattern block shapes.)
- How many sides does it have? How many corners?
- How many [triangles, hexagons, parallelograms, trapezoids] are there in this drawing?
- Can you use other shapes to fill in the [hexagon, square, trapezoid]?
- How many other ways can we fill in this outline? Or how many shapes can be replaced by other shapes?

Facilitator notes

- Show families how they can use the prompts, model asking questions (e.g., Can you fill in the same outline but with different shapes? Why?) and point out the location of the geometry glossary poster or handout for easy reference.
- Model using the correct vocabulary for shapes, but do not correct families if they use color names instead.
- If you are integrating technology into your math night, the Math Learning Center offers virtual pattern blocks that families can use to complete the activity.

Related standards

CCSS-Math and AERO Standards

- CCSS.MATH.CONTENT.K.G.B.6/ AERO.K.G.6 DOK 2,3: Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full sides touching to make a rectangle?"
- CCSS.MATH.CONTENT.1.G.A.2/ AERO.1.G.2 DOK 2,3: Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. Note: Students should apply the principle of transitivity of measurement to make indirect comparisons, but they need not use this technical term.

NCTM Related Standards from PreK–8 Curriculum Focal Points

- Recognize, name, build, draw, compare, and sort two-dimensional shapes.
- Investigate and predict the results of putting together and taking apart two-dimensional shapes.
- Recognize and represent shapes from different perspectives.
- Describe attributes and parts of two-dimensional figures.

Activity instructions, materials, family prompts, and other resources

Activity 1a: Fill in the Shapes

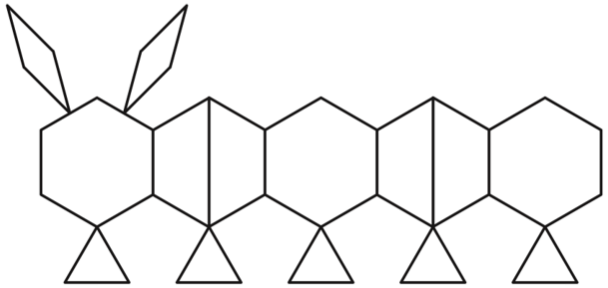
Instructions

1. Select an outline.
2. Use the pattern blocks to fill in the outline.
3. For fun, take the same outline as someone else and see how you can fill it out differently.

Players:
One or more

Goal:
Fill in the shapes

Caterpillar



Activity 1a: Fill in the Shapes

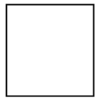
Family Prompts

Ask any of the following questions:

- What shape is this? (Point to any of the pattern block shapes.)
- How many sides does it have? How many corners?
- How many [triangles, hexagons, parallelograms, trapezoids] are there in this drawing?
- Can you use other shapes to fill in the [hexagon, square, trapezoid]?
- How many other ways can we fill in this outline? Or how many shapes can be replaced with other shapes?

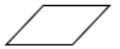
Geometry Glossary

Count the sides and the corners.
If there are three of each, it is a triangle.
If the sides are all the same length, then it is an equilateral triangle.



Count the sides and the corners.
If there are four of each, it is a quadrilateral.
If it has two pairs of parallel sides, then it is a parallelogram.
If it also has four equal angles, then it is a rectangle.
If the sides are also all the same length, then it is a square.

Count the sides, count the corners.
If there are four, it is a quadrilateral.
If it has two pairs of parallel sides, then it is a parallelogram.



Are the four angles equal? No? Then, it is not a rectangle.
Are the sides the same length? Yes? Then it is a rhombus.

Count the sides, count the angles.
If there are four, it is a quadrilateral.
Does it have two pairs of parallel sides? Yes? Then it's a parallelogram.
Does it have only one pair of parallel sides? Yes? Then it is a trapezoid.
This is a special case called an isosceles trapezoid because the angles at the base are the same measurement.

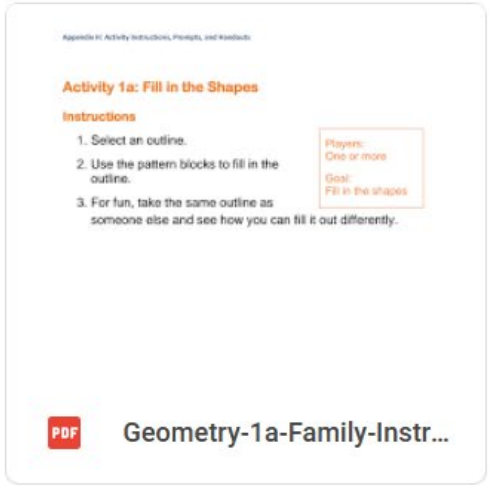
Printable facilitator guides and station materials

My Drive > Community Math Night Materials > 1) Geometry > Geometry Station 1a

Files

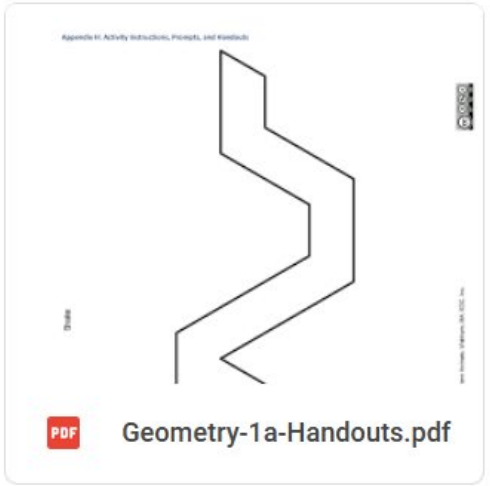
Name

PDF Geometry-1a-Facilitator-In...



PDF Geometry-1a-Family-Instr...

PDF Geometry-1a-Glossary.pdf



PDF Geometry-1a-Handouts.pdf

Geometry Station Activities

Station overview

Station 1: Geometry

- The Geometry station includes three activities:
  - Activity 1a: **Fill the Shapes**, recommended for children in grades **K through 1**.
  - Activity 1b: **Hexagon Challenge**, recommended for children in grades **2 through 3**.
  - Activity 1c: **Symmetric Mosaics**, recommended for children in grades **4 through 5**.

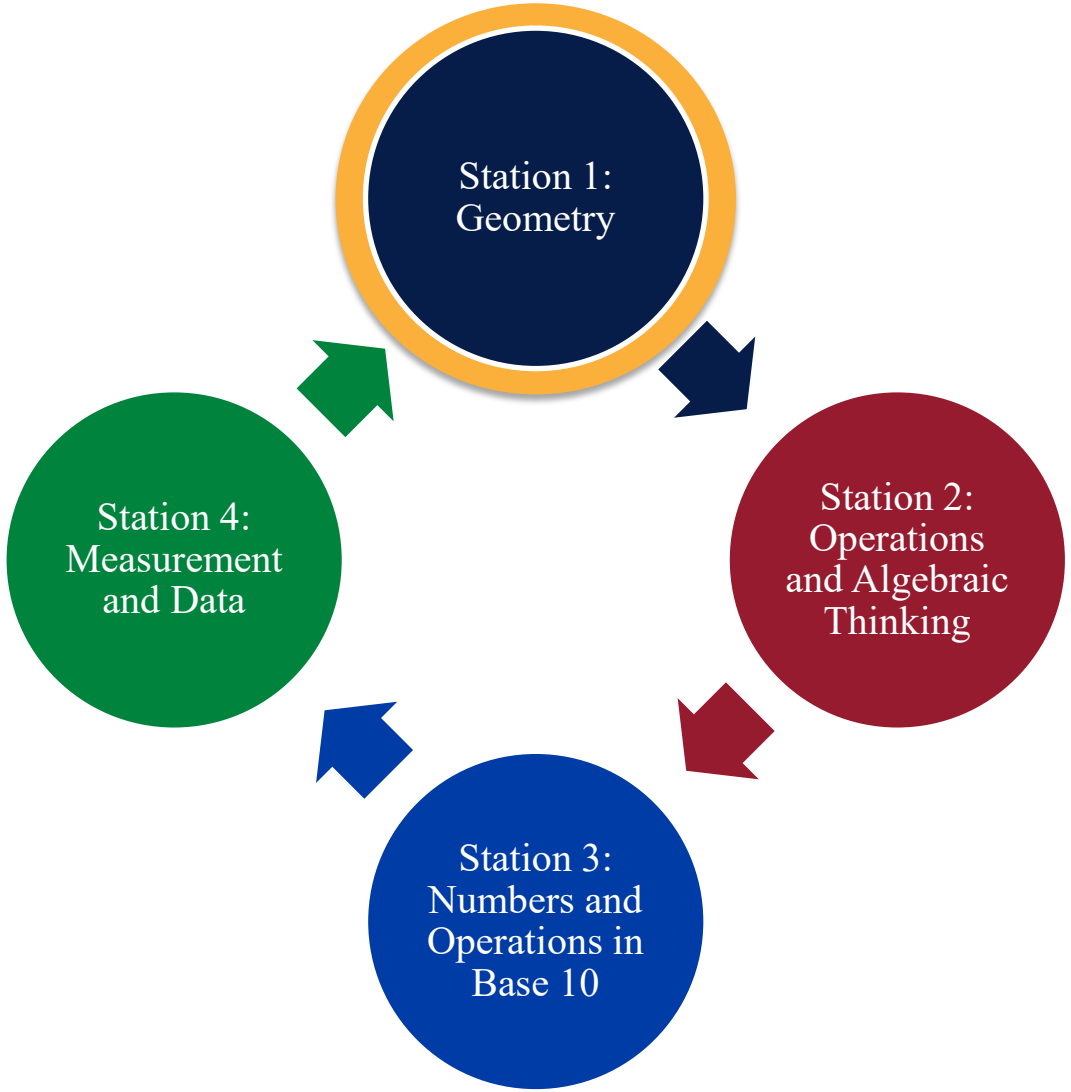
Know before you go

- Pattern blocks are three-dimensional geometric manipulatives that represent two-dimensional shapes.
- They include an equilateral triangle, a 60-degree rhombus, a 30-degree rhombus, a regular trapezoid, a regular hexagon, and a square.
- Pattern blocks help build children's foundational knowledge by giving them concrete ways to compare and manipulate shapes before moving on to abstract reasoning.

(Stein & Bovalino, 2001; Reed & Young, 2017)

For each activity…

- Review and practice each activity with your group.
- Consider:
  - How will family members engage with the activities? Will they find them engaging? Challenging?
  - Is there anything that you think will be confusing or unclear for families in your community?
  - How will you implement the activity in your school setting? Consider virtual, hybrid, and in-person implementation.



Discussion

- How will family members engage with the activities? Will they find them engaging? Challenging?
- Is there anything that you think will be confusing or unclear for families in your community?

- How will the facilitator lead these activities? What considerations are there when implementing these activities virtually?

Operations and Algebraic Thinking Station Activities

Station overview

Station 2: Operations and Algebraic Thinking

- The Operations and Algebraic Thinking station includes three activities:
  - Activity 2a: **Flip the Cards**, recommended for children in grades **K through 1**.
  - Activity 2b: **Many Ways of Counting**, recommended for children in grades **2 through 3**.
  - Activity 2c: **Game of 24**, recommended for children in grades **4 through 5**.

Know before you go

- Conceptual understanding, computational fluency, and problem-solving skills form the fundamentals of algebra.
  - **Conceptual understanding** is an understanding of mathematical concepts, operations, and relations.
  - **Computational fluency** is the skill to apply procedures accurately, efficiently, and flexibly.
  - **Problem solving** is the ability to express and solve math problems and the capacity to reflect, explain, and justify the strategy and solution mathematically.

(Thompson, 2008; National Council of Teachers of Mathematics, 2014; National Mathematics Advisory Panel, 2008; Boaler, 2015; Woodward, 2006)

For each activity…

- Review and practice each activity with your group.
- Consider:
  - How will family members engage with the activities? Will they find them engaging? Challenging?
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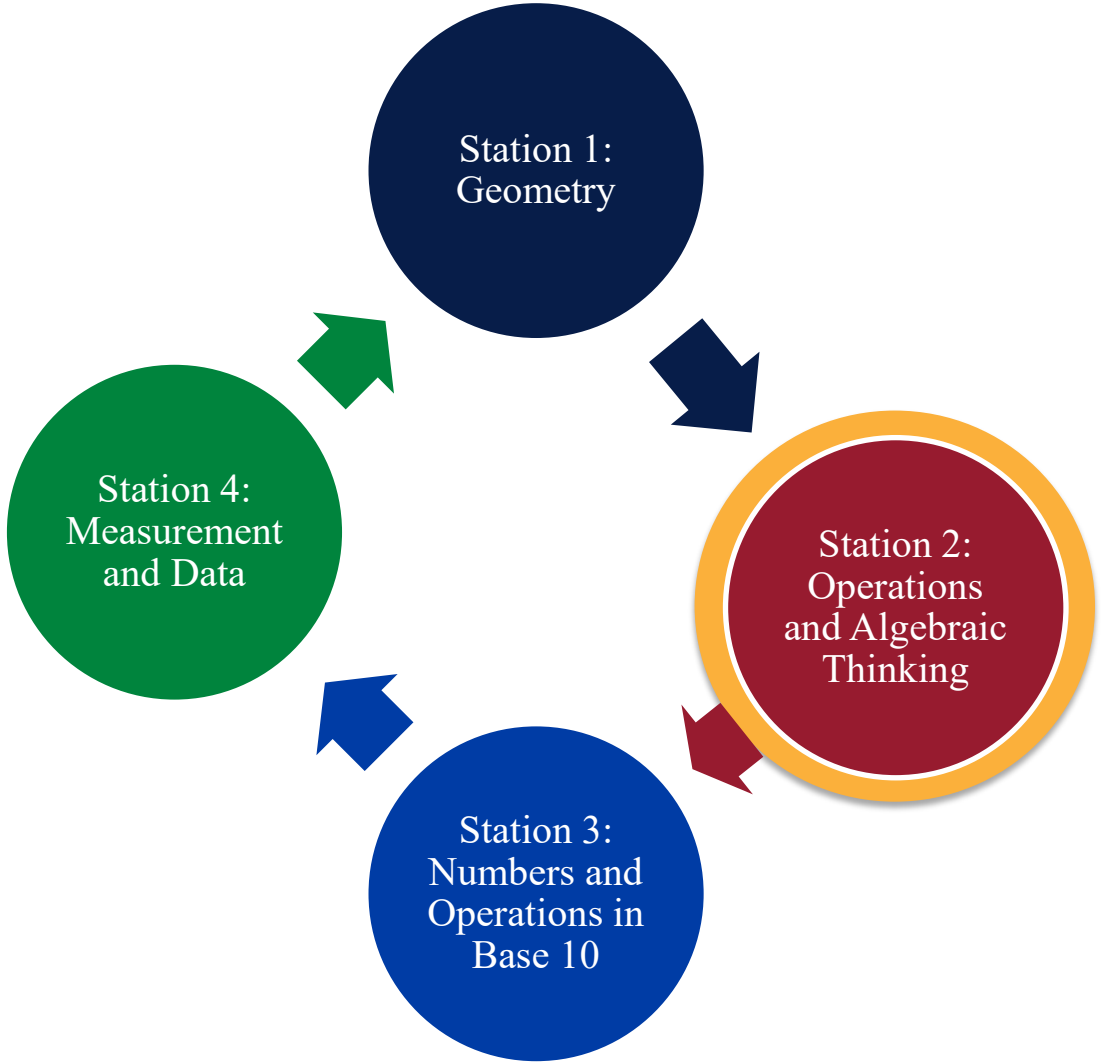


Discussion

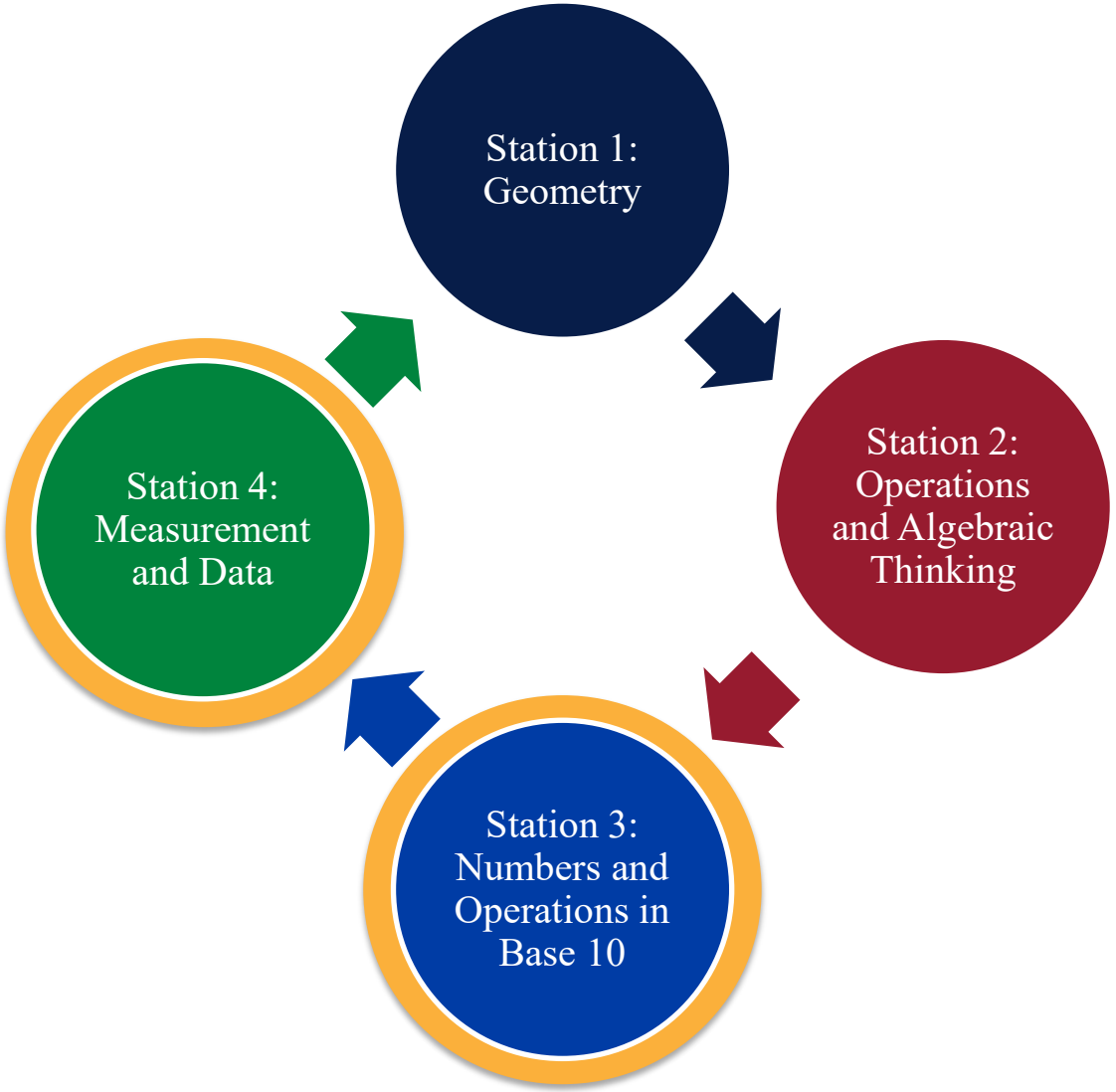
- How will family members engage with the activities? Will they find them engaging? Challenging?
- Is there anything that you think will be confusing or unclear for families in your community?

- How will the facilitator lead these activities? What considerations are there when implementing these activities virtually?

Wrap-Up

For training 2…

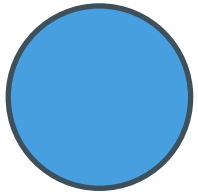
- We will review and practice stations 3 and 4.
- We will discuss ideas and support for training your colleagues and planning your Community Math Night event.



Reflecting on the day

What is something we discussed that **squared** with your experience?

What are **three points** you want to remember?



What is a lingering question still going **around** in your mind?

Thank you!

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