



# KINDERGARTEN SUPPLEMENT

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## Set C5 Geometry: Growing Shapes Calendar Pattern

### Includes

January Calendar Pattern

C5.1

### Skills & Concepts

- ★ identify, describe, and compare triangles, rhombuses, trapezoids, and hexagons
- ★ combine shapes to create two-dimensional objects
- ★ describe simple growing patterns with shapes
- ★ analyze simple repeating and growing relationships to extend patterns
- ★ use cardinal and ordinal numbers

**Bridges in Mathematics Grade K Supplement**

**Set C5** Geometry: Growing Shapes Calendar Pattern

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*Bridges in Mathematics* is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates the Number Corner, a collection of daily skill-building activities for students.

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# Set C5 ★ January Calendar Pattern



## CALENDAR GRID

### Growing Shapes

#### Overview

This set of Calendar Grid markers replaces the student-made markers in the month of January. The first marker in the sequence shows a green triangle pattern block. The second shows a blue rhombus. The third shows a red trapezoid. The fourth shows a red trapezoid and a green triangle. The fifth shows a red trapezoid and a blue rhombus, and the sixth a hexagon. The figures grow larger from one marker to the next, but the sequence does not stop and then start over again. It just keeps growing. This may puzzle kindergartners, because up until now, much of our instruction has focused on repeating patterns, patterns composed of a basic unit or “core,” such as AB or ABC, or ABBC, that repeats over and over again. The markers this month are designed to help children understand that a pattern can also be a sequence of shapes or numbers that *grows* or *increases* in a predictable way.

#### Skills & Concepts

- ★ identify, describe, and compare triangles, rhombuses, trapezoids, and hexagons
- ★ combine shapes to create two-dimensional objects
- ★ describe simple growing patterns with shapes
- ★ analyze simple repeating and growing relationships to extend patterns
- ★ use cardinal and ordinal numbers

#### You'll need

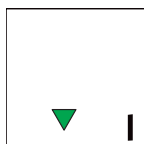
- ★ Calendar Grid pocket chart
- ★ Day, Month, and Year Calendar Grid cards
- ★ Growing Shapes Calendar Markers (available at <http://gotomlc.org/calmarkers>) Print 1 copy of the calendar marker sheets in color, single-sided, on white cardstock. Cut the calendar markers apart and laminate if desired.
- ★ pattern blocks
- ★ 2 pieces of lined chart paper (see Advance Preparation)
- ★ helper jar containing a popsicle stick for each child with his/her name on it

**Advance Preparation** Draw 3 columns on both sheets of lined chart paper, as shown below. Add a title and column labels to the first sheet, and post the sheet next to your Calendar Grid pocket chart. Keep the second sheet in reserve until the middle of the month, and then attach it to the first so you can continue to record observations through the entire month.

Growing Shapes Pattern		
Date	Shapes	? ▲'s

#### Introducing the Growing Shapes Calendar Markers

Open your first Number Corner lesson in January by directing students' attention to the calendar grid. Explain that you will put up a new calendar marker as each day of the month passes. Place the first marker in the correct pocket, and ask children to pair-share observations.



January Calendar Pattern (cont.)

What do they notice about this marker? After a few moments, pull sticks from your helper jar to call on children to share their observations with the class. As students share their observations, ask them to identify the shape by name and explain how they know that it is a triangle.

**Students** *It looks like one of those green pattern blocks.*  
*It looks like a shark tooth!*  
*It's really little.*

**Teacher** *Sari mentioned that the shape on our calendar marker looks like one of our pattern blocks. Sari, could you go over to the tub of pattern blocks and bring back the one you're thinking of?*

**Sari** *It's the same as this one, see?*


**Tomas** *That's a triangle!*


**Teacher** *Tomas says the shape is a triangle. Do you agree? How do you know it's a triangle, not a circle or a square? Talk with the person next to you, and then we'll have some folks share their ideas with the class.*

**Students** *It's not a circle because it isn't round!*  
*It's a triangle because it looks like a mountain.*  
*But it's upside down!*  
*It has 3 points on it, so it must be a triangle.*

Summarize students' observations. Then record the date and the name of the shape on the chart. Leave the third column blank for now.

**Teacher** *We seem to agree that this shape is a triangle. It looks like the green triangle in our pattern blocks. It has 3 sides and 3 corners. Let's record the date and the name of the shape on our calendar chart.*

 <b>January</b>						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	▼ 1					

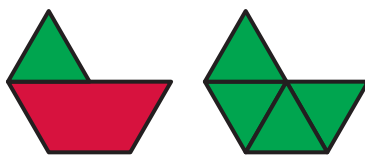
Growing Shapes Pattern		
Date	Shapes	?  's
1st	1 triangle	

Repeat the process described above on the second and third day of the month. Unless children are very familiar with the names of the pattern block shapes, you will probably have to introduce the shape names *rhombus* and *trapezoid*. On the fourth day, children will notice that there are two shapes instead of one on the marker. Discuss and record both on your chart.

Then ask the children if they think it would be possible to build a figure the same size and shape as the one on the fourth marker using only green triangle pattern blocks. If so, how many green triangles would it take? Discuss these questions with the class. Then ask a volunteer to replicate the figure on





## January Calendar Pattern (cont.)






marker 4 with pattern blocks, and have a second child build the figure again using just green triangle blocks. If necessary, have the second child build directly on top of the first figure, and then move the new figure to the right. Unless your class is very small, you might want to have the children build at the document camera so everyone can clearly see their work.



**Maya** See, I just put 3 triangles together like this for the bottom part, and then 1 on top. It looks the same as the one Justin made, but mine is made out of all triangles.

Record the results of this investigation on the chart. Then work backward with the class to determine how many green triangles it would take to build each of the figures that have appeared so far: the trapezoid, the rhombus, and the triangle. Record each of these numbers on your chart as well.

January						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	 1	 2	 3	 4		

Growing Shapes Pattern		
Date	Shapes	?  's
1st	1 triangle	1  's
2nd	1 rhombus	2  's
3rd	1 trapezoid	3  's
4th	1 trapezoid, 1 triangle	4  's

## Continuing through January with the Calendar Grid

Each day, have a helper point to the markers that have been posted in the pocket chart as the class names the shapes they see. Have children predict what the next marker will show before you place it on the chart. As they share their predictions, press them to explain their thinking.

**Teacher** Today is Friday, January 5th. What do you think we'll see on today's calendar marker? Talk it over with the person next to you, and then I'll use the sticks to choose children to share their ideas with the class.

**Marcus** I think maybe it will be one little green triangle.

**Teacher** Why?

**Marcus** Because maybe it will start over again.

**Teacher** Oh, so we've had a triangle, a rhombus, a trapezoid, and then a trapezoid plus a triangle, and today, you think maybe the whole pattern will start over again?

**Marcus** Yep.

**Teacher** Any other predictions?

## January Calendar Pattern (cont.)

**Students** I think it might be one of those yellow hexagons because the shapes keep getting bigger and bigger.

Maybe it will be a trapezoid with a blue one on top, because yesterday it had a green one on top.

Maybe it will be one of those orange squares with a little triangle on top, like a house.

Ooohhh, maybe a red one and two green ones on top!

Once the new marker has been posted, ask students to share their observations, and work with the class to find out how many green triangles it takes to build the new shape. Record the information on the chart paper.

January						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	▼ 1	▱ 2	▱ 3	▱ 4	▱ 5	

Growing Shapes Pattern		
Date	Shapes	? ▲'s
1st	1 triangle	1 ▲
2nd	1 rhombus	2 ▲'s
3rd	1 trapezoid	3 ▲'s
4th	1 trapezoid, 1 triangle	4 ▲'s
5th	1 trapezoid, 1 rhombus	5 ▲'s




















**Students** Maybe it will take 6 triangles to make the next shape!



















Yeah, maybe it'll be like the hexagon from the pattern blocks.

On the next page, you'll find the calendar grid and chart filled in through the 17th of the month. As you study it, what patterns can you find? Here are some questions to consider:

- How do the figures change from one marker to the next?
- How many triangles does it take to build each figure?
- How does the number of triangles required to build each figure relate to the date on the marker?
- Are there any repeating patterns to be found?
- What will the 18th marker in the sequence show? How do you know?

## January Calendar Pattern (cont.)

January						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	 1	 2	 3	 4	 5	 6
 7	 8	 9	 10	 11	 12	 13
 14	 15	 16	 17			

Growing Shapes Pattern		
Date	Shapes	?  's
1st	1 triangle	1 
2nd	1 rhombus	2 
3rd	1 trapezoid	3 
4th	1 trapezoid, 1 triangle	4 
5th	1 trapezoid, 1 rhombus	5 
6th	1 hexagon	6 
7th	1 hexagon, 1 triangle	7 
8th	1 hexagon, 1 rhombus	8 
9th	1 hexagon, 1 trapezoid	9 
10th	1 hexagon, 1 trapezoid, 1 triangle	10 
11th	1 hexagon, 1 trapezoid, 1 rhombus	11 
12th	2 hexagons	12 
13th	2 hexagons, 1 triangle	13 
14th	2 hexagons, 1 rhombus	14 
15th	2 hexagons, 1 trapezoid	15 
16th	2 hexagons, 1 trapezoid, 1 triangle	16 
17th	2 hexagons, 1 trapezoid, 1 rhombus	17 

If you predicted that 3 hexagons will appear on the 18th marker, you are correct. What enabled you to make that prediction accurately? On which other days are the figures on the markers built entirely of hexagons? How many more times will this happen before the end of the month? Why?

Here are some additional questions and prompts you might use to help your students investigate this pattern through the month:

- Let's say the names of the shapes on each marker so far.
- How many triangles did it take to build the figure on yesterday's marker? How many triangles do you think it will take to build the figure on today's marker?
- Which shapes do you think we'll see on the next marker? Why?
- Can you find any patterns in the markers so far? Are there any patterns you can see?
- Which of the markers so far have only hexagons on them?
- Can you show or tell the date for the next marker that will show only hexagons?
- If we mark one of the diagonals on our grid by placing a yardstick over markers 4, 10, and 16, do you notice any patterns? What if we look at the diagonal formed by markers 5, 11, and 17?

Despite the fact that there are both repeating and growing patterns to be found in the sequence of markers this month, don't be too surprised if some of your students can't see them, or remain unconvinced that there are any patterns at all. The leap from repeating to growing patterns is a big one, and students will have other opportunities this year and next to build new understandings.

### Extensions

- Each day from the middle of the month on, challenge interested students to build with pattern blocks what they believe the next figure in the sequence will be. Invite them to leave the figures they create

## January Calendar Pattern (cont.)

near the calendar so they can confirm their ideas the next day. Some children may be interested in building several figures forward.

- At the end of the month, you might ask students to imagine what the markers would look like if the pattern continued beyond the 31st. Invite them to build the figures they think they would see on markers 32, 33, and 34.

**CHALLENGE**

- A few of your students may be interested in investigating the number of pattern blocks there are in each figure. For instance, the first three figures are built with 1 pattern block each. The next two figures are each comprised of 2 pattern blocks. The sixth figure only takes 1 pattern block. If you list the number of pattern blocks per figure in a long column and circle the numbers that are the same, you and the students may discover some interesting patterns as the month progresses. (It's okay if there is only 1 number in a circle; the key is to loop the identical numbers.)

How many pattern blocks are there in each figure?

































1  
 1  
 1  
 2  
 2  
 1  
 2  
 2  
 2  
 3  
 3  
 2

↓

- Challenge your students to build their own growing patterns with pattern blocks or Unifix cubes. Can they make a series of designs or trains that grows in a predictable manner from one arrangement to the next?

## January Calendar Pattern (cont.)

**NOTE** Below is a representation of the January calendar grid. The full-size calendar markers are available at <http://gotomlc.org/calmarkers>.

 <b>January</b>						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	 1	 2	 3	 4	 5	 6
 7	 8	 9	 10	 11	 12	 13
 14	 15	 16	 17	 18	 19	 20
 21	 22	 23	 24	 25	 26	 27
 28	 29	 30	 31			

