



# GRADE 1 SUPPLEMENT

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## Set C4 Geometry: Symmetry Calendar Pattern

### Includes

December Calendar Pattern

C4.1

### Skills & Concepts

- ★ recognize and create shapes that are congruent or have symmetry
- ★ identify a line of symmetry
- ★ compose and decompose plane figures (e.g., make two triangles from a square) and describe the part-whole relationships, the attributes of the figures, and how they are different and similar
- ★ identify and model one-half and one-fourth of a whole, using region/area models
- ★ understand that fractional parts are equal shares of a whole
- ★ understand that the fraction name (half, fourth) tells the number of equal parts in the whole

**Bridges in Mathematics Grade 1 Supplement**

**Set C4** Geometry: Symmetry 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 C4 ★ December Calendar Pattern



## CALENDAR GRID

### Symmetry

#### Overview

This set of Calendar Grid markers replaces the student-made markers in the month of December and provides opportunities for first graders to explore concepts of symmetry, congruence, and fractions.

#### Skills & Concepts

- ★ recognize and create shapes that are congruent or have symmetry
- ★ identify a line of symmetry
- ★ compose and decompose plane figures (e.g., make two triangles from a square) and describe the part-whole relationships, the attributes of the figures, and how they are different and similar
- ★ identify and model one-half and one-fourth of a whole, using region/area models
- ★ understand that fractional parts are equal shares of a whole
- ★ understand that the fraction name (half, fourth) tells the number of equal parts in the whole

#### You'll need

- ★ Calendar Grid pocket chart
- ★ Day, Month, and Year Calendar Grid cards
- ★ Symmetry Calendar Markers (available at <http://gotomlc.org/calmarkers>) Print 1 copy of the calendar marker sheets, preferably in color, single-sided, on white cardstock. Cut the calendar markers apart and laminate if desired.
- ★ December Calendar Grid Observations sheet from Set C2 (see Advance Preparation)
- ★ ruler or pointer
- ★ a pair of scissors
- ★ 1 or more small pocket mirrors (optional)
- ★ helper jar containing a popsicle stick for each child with his/her name on it

**Advance Preparation** Run 1 set of the calendar markers on paper. Then run a second set in color on cardstock. Cut the paper markers apart and keep them in reserve near your calendar grid. Cut the cardstock markers apart and laminate them. Erase the Calendar Grid Observations sheet from Set C2. Redraw the lines to create 4 columns. Label the columns at the top of the first sheet as shown below for use with this month's markers.

| Calendar Grid Observations |        |                             |              |
|----------------------------|--------|-----------------------------|--------------|
| Date                       | Figure | When you fold it in half... | Symmetrical? |
|                            |        |                             |              |
|                            |        |                             |              |
|                            |        |                             |              |
|                            |        |                             |              |

## December Calendar Pattern (cont.)

## Introducing the Symmetry Calendar Grid Pattern: Days 1 &amp; 2

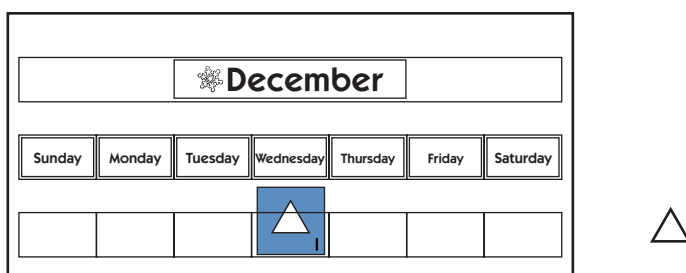
Open your first Number Corner lesson in December by directing students' attention to the calendar grid. Place the first marker in the correct pocket, and ask children to pair-share observations. What do they notice about this marker? After a few moments, pull popsicle sticks from your helper jar to call on children to share their observations with the class.

**Students** *It's a triangle!*

*Are we going to do shapes again this month?*

*That triangle is like the ones in the pattern blocks.*

After the children have had a chance to share a few observations, show them your paper copy of the first marker. As they watch, cut out the triangle. Set it on top of the triangle in the pocket chart so students can see that it's exactly the same. Then ask students what would happen if you folded the paper triangle in half.



**Students** *Can I do it? I know how to do it!*

*Let's pick someone from the helper jar!*

**Teacher** *We'll do that in a minute, but right now, I'd like you make some predictions. If we fold this triangle in half, how will it look? Will we get new shapes? Will they be smaller or larger than this triangle? Talk with the person next to you for a few moments, and then I'll call on some people to share their ideas with the group.*

**Students** *It will get smaller if you fold it in half.*

*There will be a line down the middle where you fold it.*

*I think if you fold it and open it up, there will be 2 little triangles.*

*I think they'll be skinnier, like 2 little triangles.*

Choose a helper to fold the paper triangle in half. Work with him/her to make sure the edges of the paper are lined up properly. Have the helper hold up the triangle, still folded, for the group to see. Invite comments about the folded triangle, and ask students to predict what they'll see when you unfold it. Then unfold the triangle, and solicit observations.



**Students** *It makes two littler triangles.*

*They look like the ramp blocks from kindergarten.*




*They're both the same—it's like 2 perfect halves.*

## December Calendar Pattern (cont.)

Fold and unfold the triangle as necessary until students agree that the two halves match. Then explain that if you fold a figure in half and the two halves are exactly the same size and shape, that figure is said to be symmetrical. Post the folded paper triangle somewhere near your calendar grid.

Before you conduct Number Corner the following day, post the observation sheet next to the calendar grid. Have students make predictions about the second marker. Then post it in the correct pocket and have a few students share their observations. Show the paper copy of the figure, and cut it out as students watch. What will happen if you fold it in half? What shape will each of the halves be? Will they be exactly the same size and shape?

After some discussion, choose a helper to fold the figure. Solicit children's observations and comments. Then post the folded paper square near the calendar grid, and work with input from the class to record the results on the observation sheet. If time allows, enter information about the first marker as well. If not, work with a couple of interested students to do so at another time during the day.

| Calendar Grid Observations |          |   |              |
|----------------------------|----------|---|--------------|
| Date                       | Figure   | When you fold it in half...   | Symmetrical? |
| 12/1                       | Triangle | It makes 2 little  's.   | Yes          |
| 12/2                       | Square   | You get 2  's or 2  's. |              |
|                            |          |   |              |
|                            |          |   |              |



## Continuing through December with the Calendar Grid

Each day, have a helper point to the markers in the pocket chart as students identify whether or not each shape posted so far is symmetrical or not. If time allows, have a second helper point to the markers as the class names the figures. Have children predict what the next marker will show before you place it in the pocket chart. Once the new marker has been posted, ask students to share their observations and predictions. Does the figure look symmetrical? Do they think it can be folded into two halves that are exactly the same size and shape? Have them find out by actually folding the paper copy of the figure, and then work with their input to fill in the observation chart.

Students will soon discover that some of the figures are symmetrical, but others are not. They will also discover that in some cases, there are two or more ways to fold a figure to create two symmetrical halves. For instance, the figure on the fourth marker—a rhombus—can be folded in 2 different ways. For this reason, it is said to have 2 *lines of symmetry*. Because children are actually folding the figures, the lines of symmetry are easy to see, and you can introduce the concept and the term *line of symmetry* on the spot.

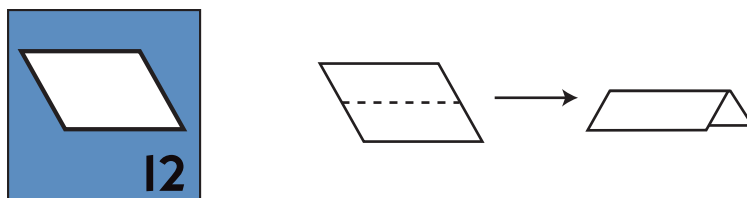
Here is a summary of the questions and prompts mentioned so far, as well as some others you might use through the month:

- Let's say the name of the figure on each marker.
- Let's tell whether or not the figure on each marker is symmetrical or asymmetrical.
- What figure do you think we'll see on today's marker? Do you think it will be symmetrical or not? Why?

## December Calendar Pattern (cont.)

- Now that we have posted today's marker, what observations can you make about the figure? How many sides does it have? How many corners? Do you think it's symmetrical? Why or why not? Do you think it will have more than one line of symmetry? If so, how many? Can you use the ruler to show where you think the line(s) of symmetry will be?
- Let's test your hypotheses by folding the paper version of the figure. Can we fold it in half? Do the two parts match exactly? What shape is each of the halves?
- Is there more than one way to fold the figure in half? How many different ways can we find? How many lines of symmetry does the figure have?
- Which markers so far show figures that are asymmetrical? When do you think we'll see the next one? How do you know?
- Will the figure on Marker 14 (19, 21, 25) be symmetrical or asymmetrical? How do you know?
- Let's look at the figures on Markers 2, 4, 7 and 9. How are they different? How are they alike?
- Can you find and describe any patterns in the markers this month? (AAB: Symmetrical, symmetrical, asymmetrical; AAAAB: shape, shape, shape, shape, alphabet letter; ABABC: non-quadrilateral, quadrilateral, non-quadrilateral, quadrilateral, alphabet letter.)

**Note** Every third marker in this sequence features an asymmetrical figure. Consider running extra paper copies of some of these. Even though some students may immediately detect the asymmetry on Markers 3, 6, 9, and so on, others will be eager to keep folding until they have exhausted all possibilities. The parallelogram on Marker 12 (shown below) is particularly challenging. Although it looks like it might be symmetrical because the two halves are congruent, notice that they are not mirror images of one another. This is when it will become important to establish that in order for a figure to be symmetrical, the two halves must "flop over" on top of one another exactly.

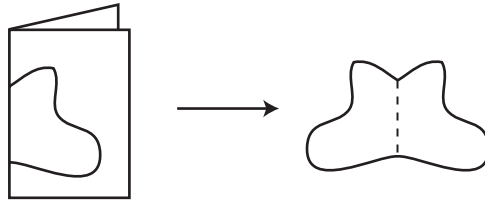


### Extensions

- Post the folded paper copy of each marker near your calendar grid through the month. Toward the end of the month, take these down and ask the class to find different ways to sort them (i.e., symmetrical, asymmetrical; quadrilateral, not quadrilateral; shapes, letters; lines of symmetry—0, 1, 2, or more; and so on).
- On the last day of school before winter break, display all of the markers in the sequence. There are 6 letters in the collection: T, W, N, E, I, and R. Pull these out of the pocket chart and challenge students to re-order the letters so they form a single word (winter).

## December Calendar Pattern (cont.)
































- Give each child a piece of paper to fold in half and then cut. Can they predict how the figure will look before they unfold their paper? Have them color or paint their cutouts in a symmetrical way. Display the cutouts on the classroom wall.



- Teach the students how to cut paper snowflakes.
- Encourage students to build symmetrical designs with the pattern blocks.

December Calendar Pattern (cont.)

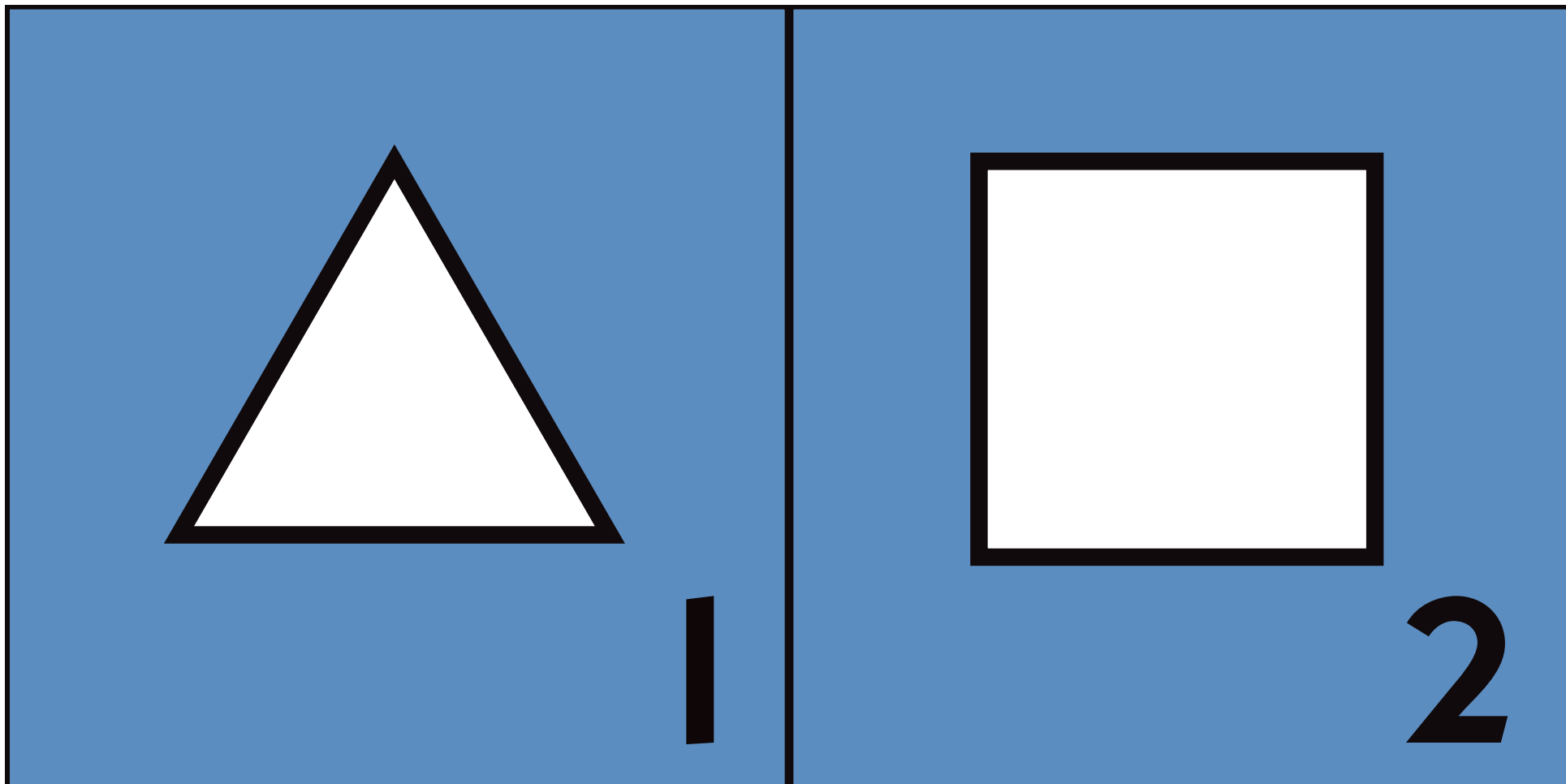
**NOTE** Below is a representation of the December calendar grid. The full-size calendar markers are available at <http://gotomlc.org/calmarkers>.

| December   |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
| 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 |  |



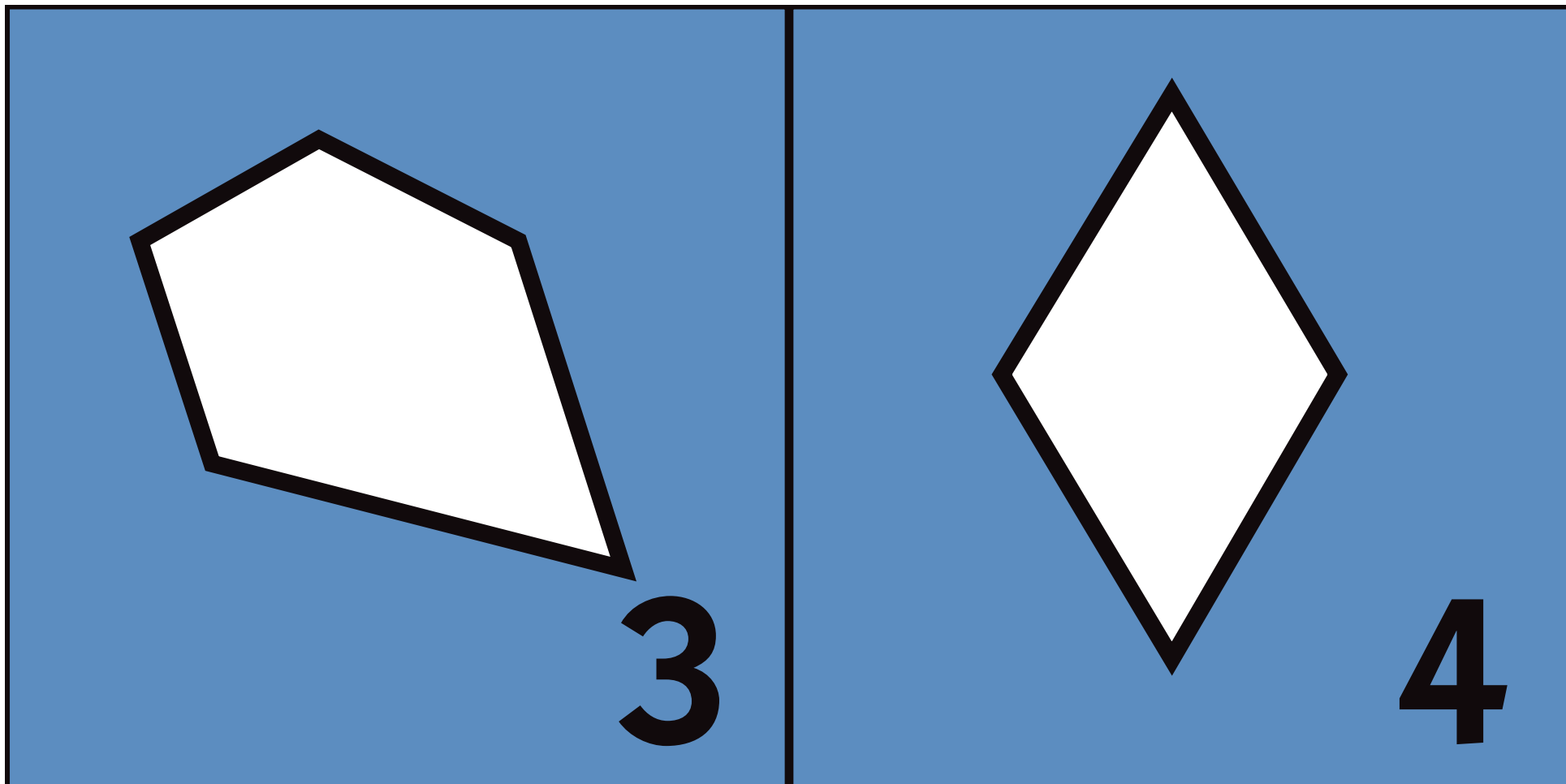
Print 1 copy of the calendar marker sheets, preferably in color, single-sided, on white cardstock. Cut the calendar markers apart and laminate if desired.

## December Symmetry Calendar Markers Sheet 1 of 16



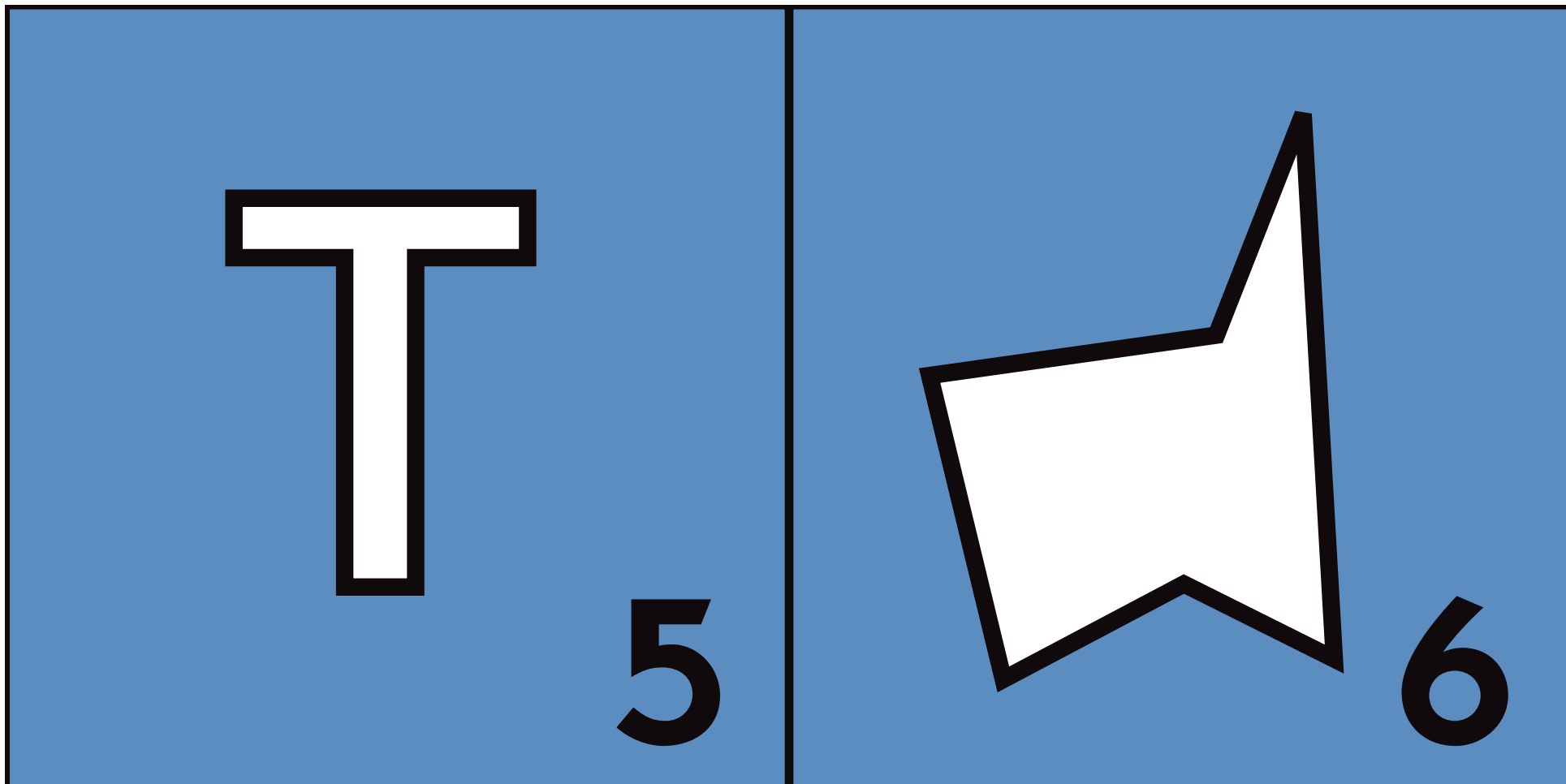
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## **N**December Symmetry Calendar Markers Sheet 2 of 16



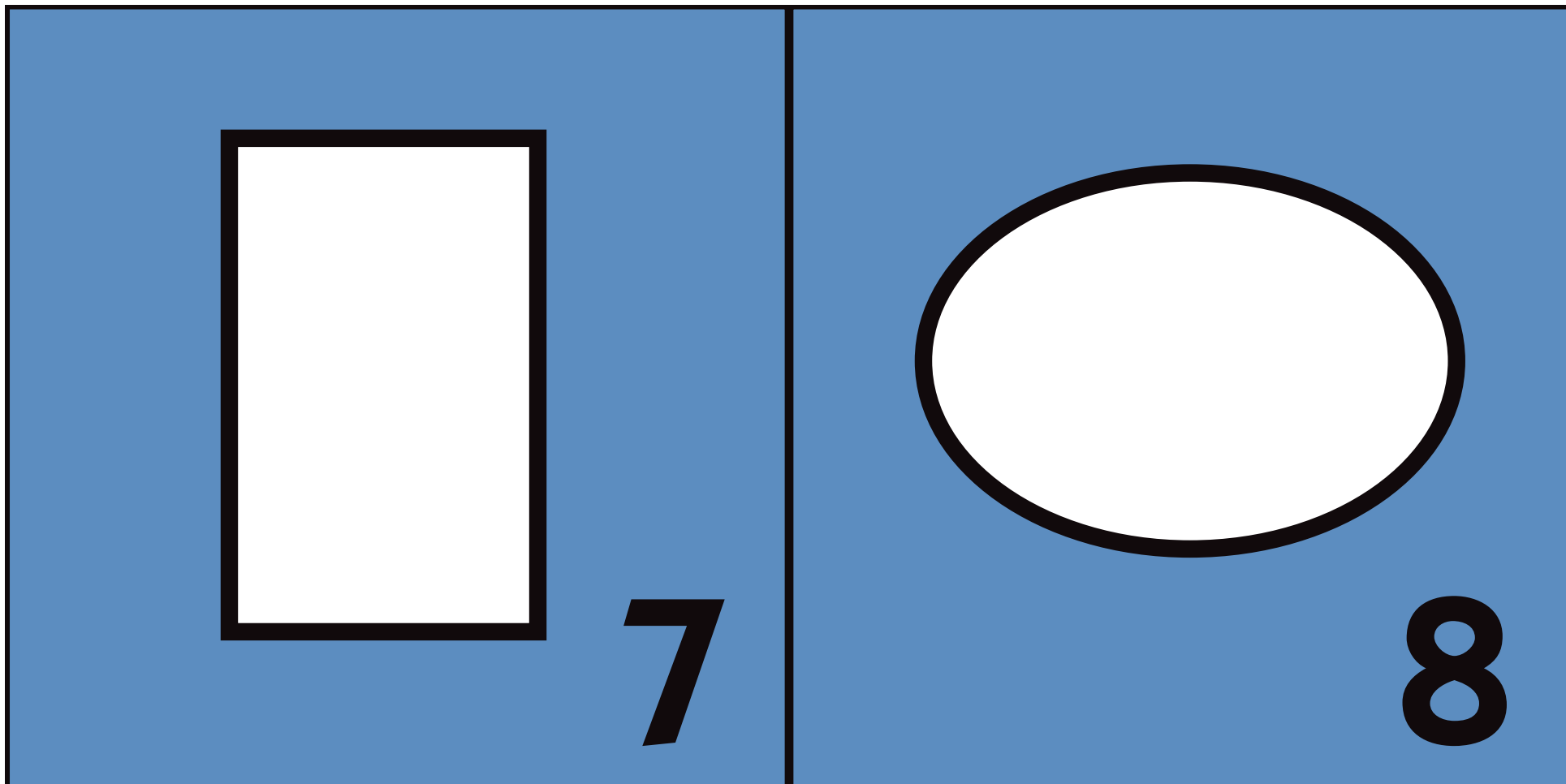
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## December Symmetry Calendar Markers Sheet 3 of 16



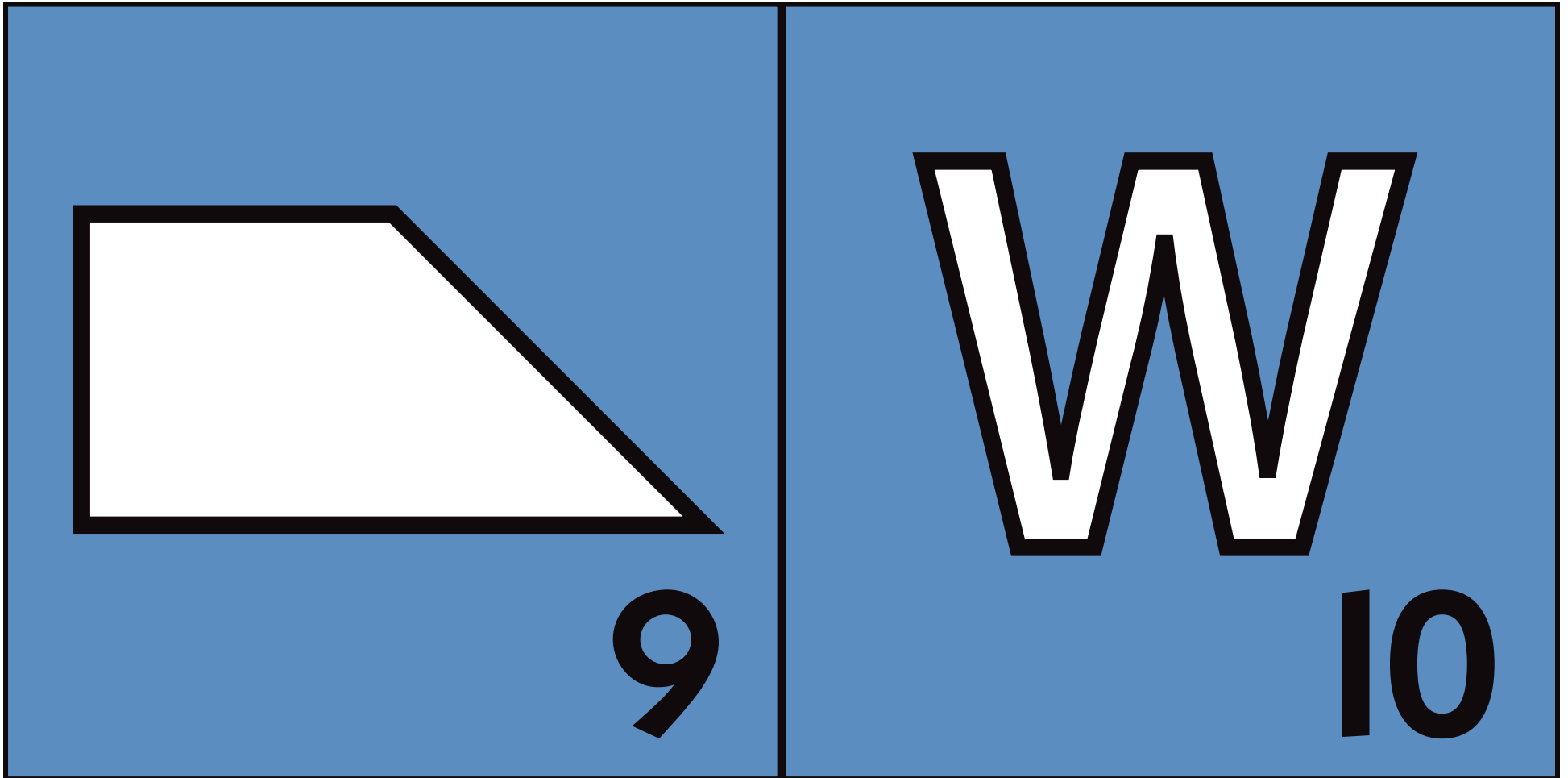
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## **N**December Symmetry Calendar Markers Sheet 4 of 16



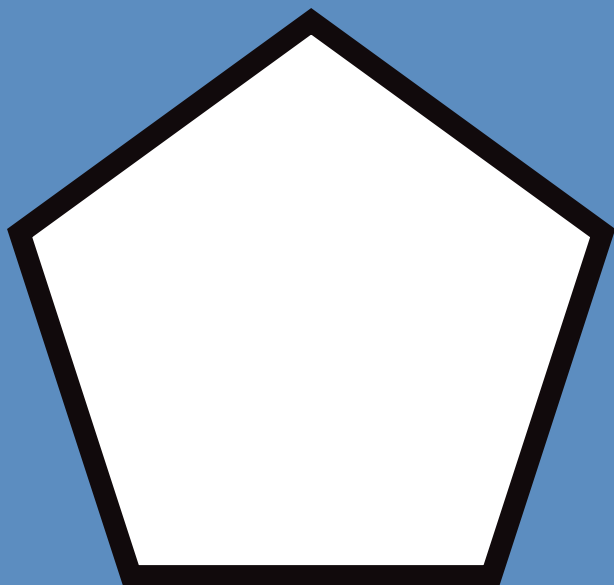
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## December Symmetry Calendar Markers Sheet 5 of 16

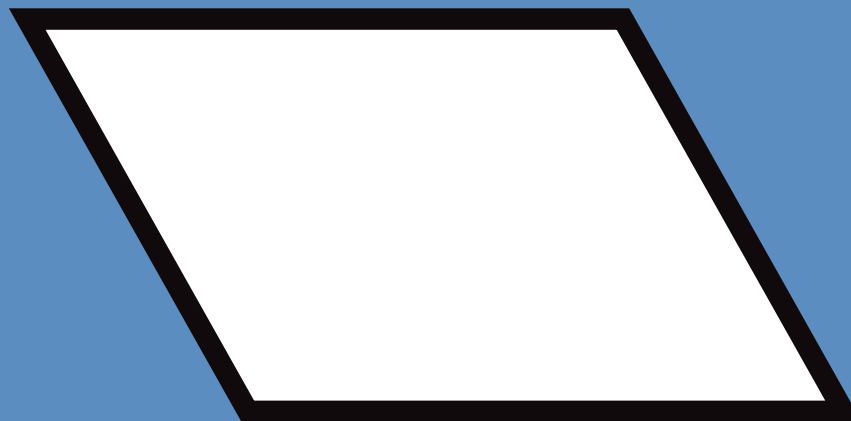


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## December Symmetry Calendar Markers Sheet 6 of 16



11



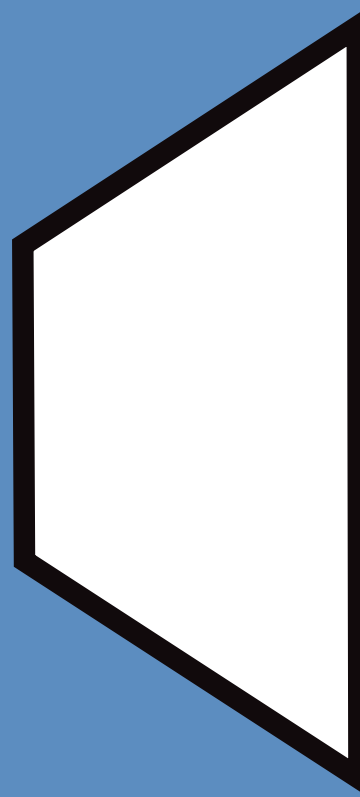
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## December Symmetry Calendar Markers Sheet 7 of 16



**13**



**14**

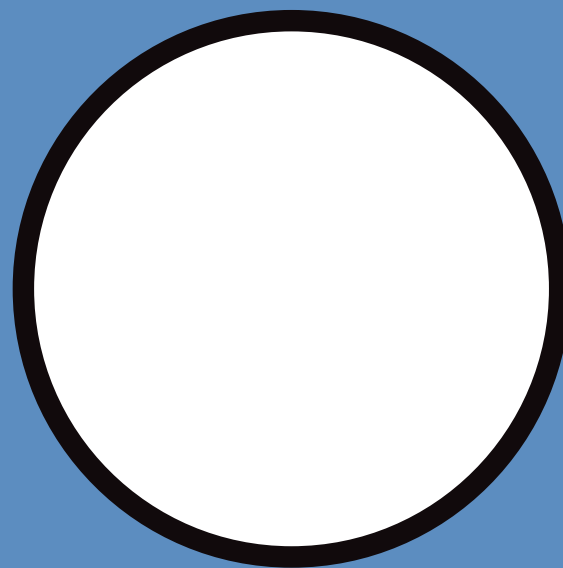
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## December Symmetry Calendar Markers Sheet 8 of 16



**N**

**15**

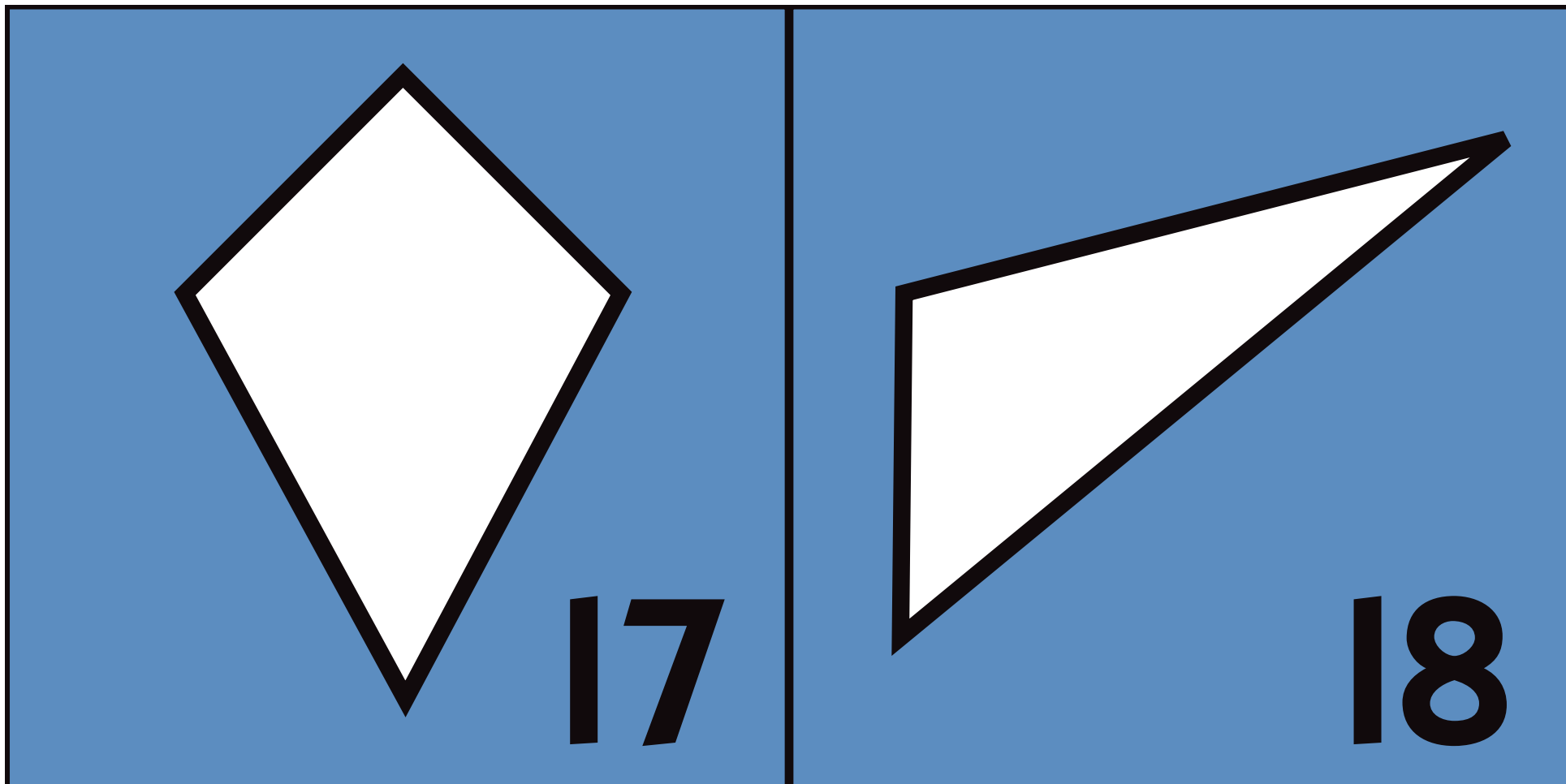


**16**



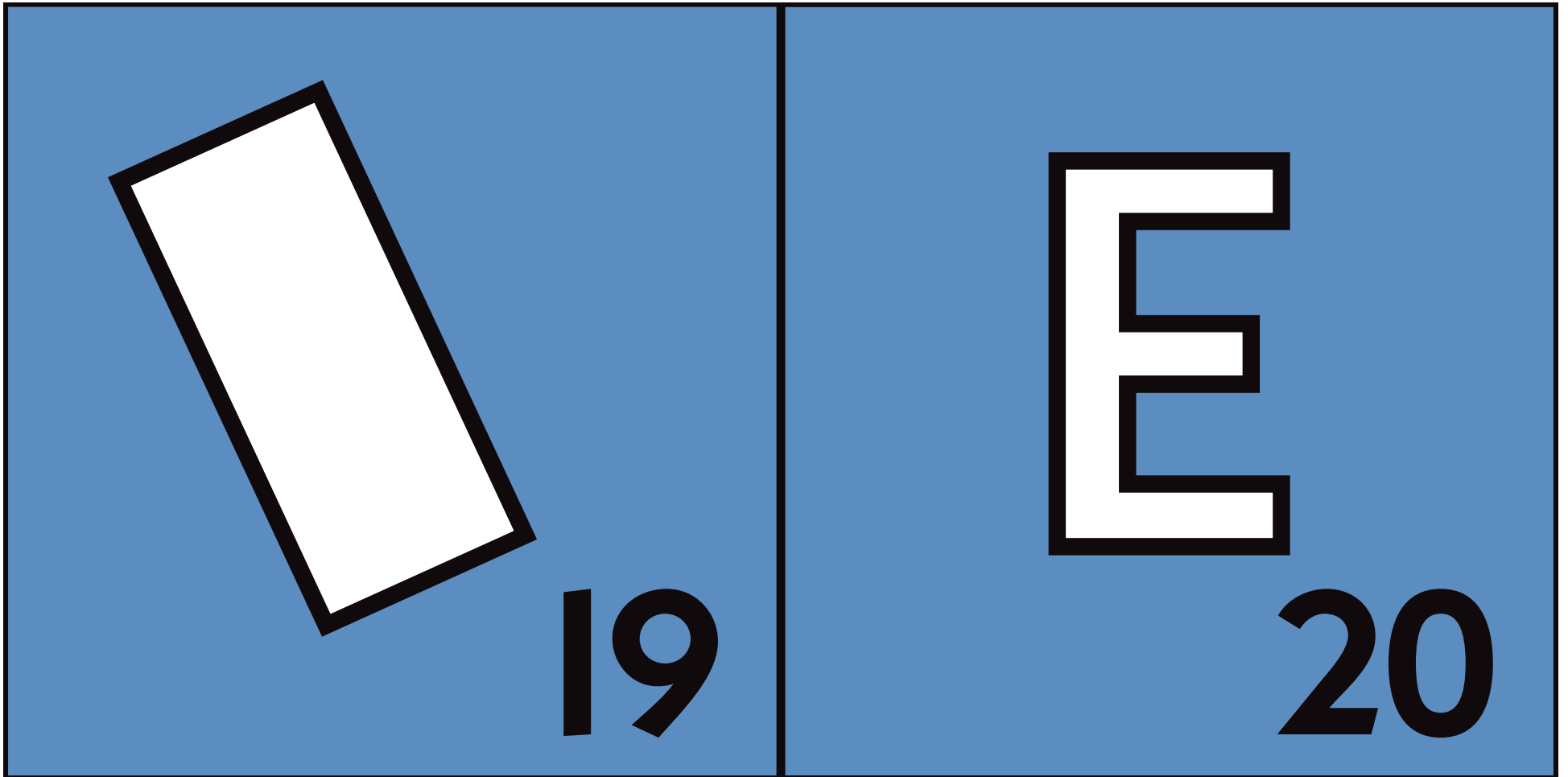
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## December Symmetry Calendar Markers Sheet 9 of 16



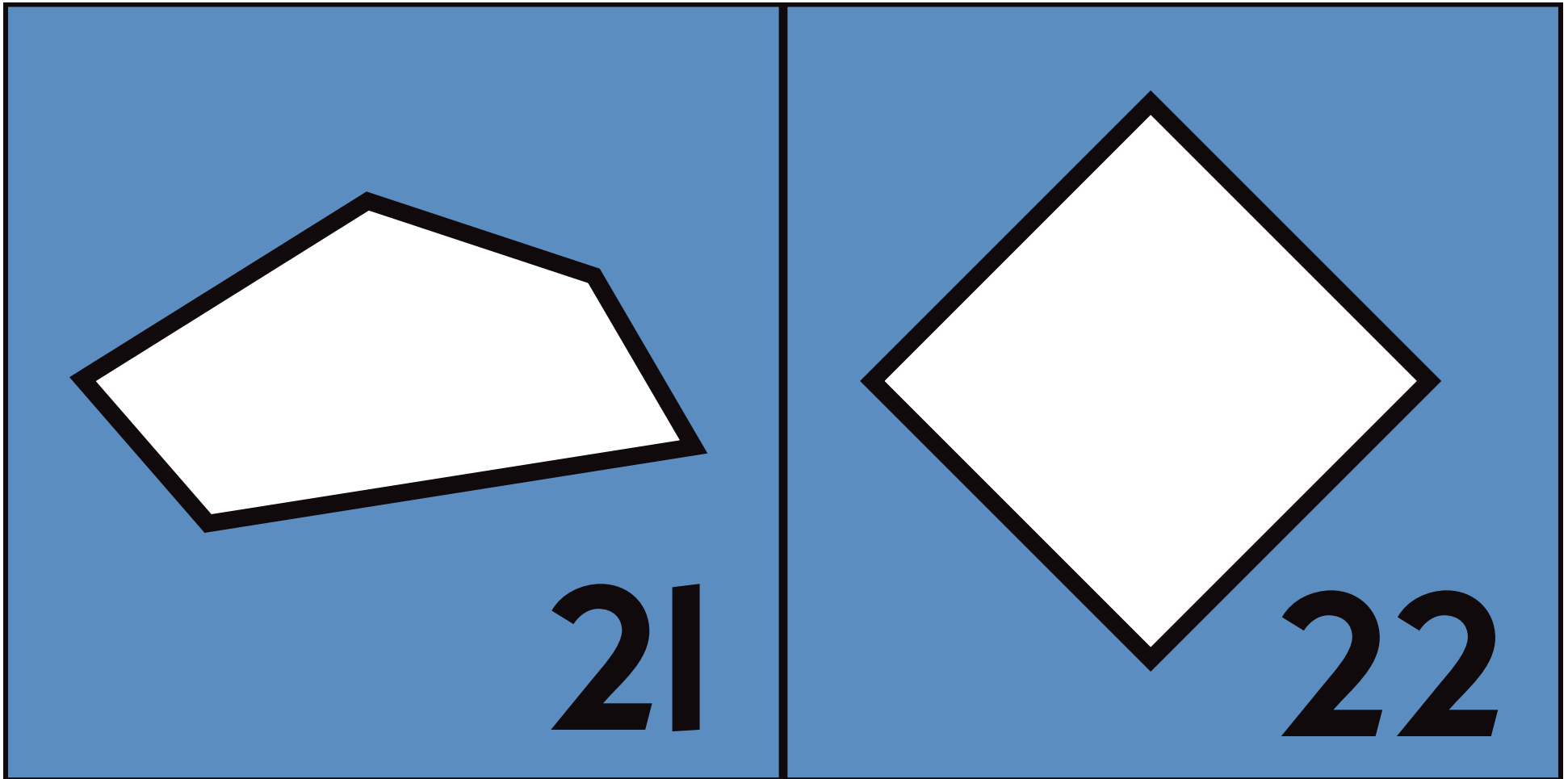
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## December Symmetry Calendar Markers Sheet 10 of 16



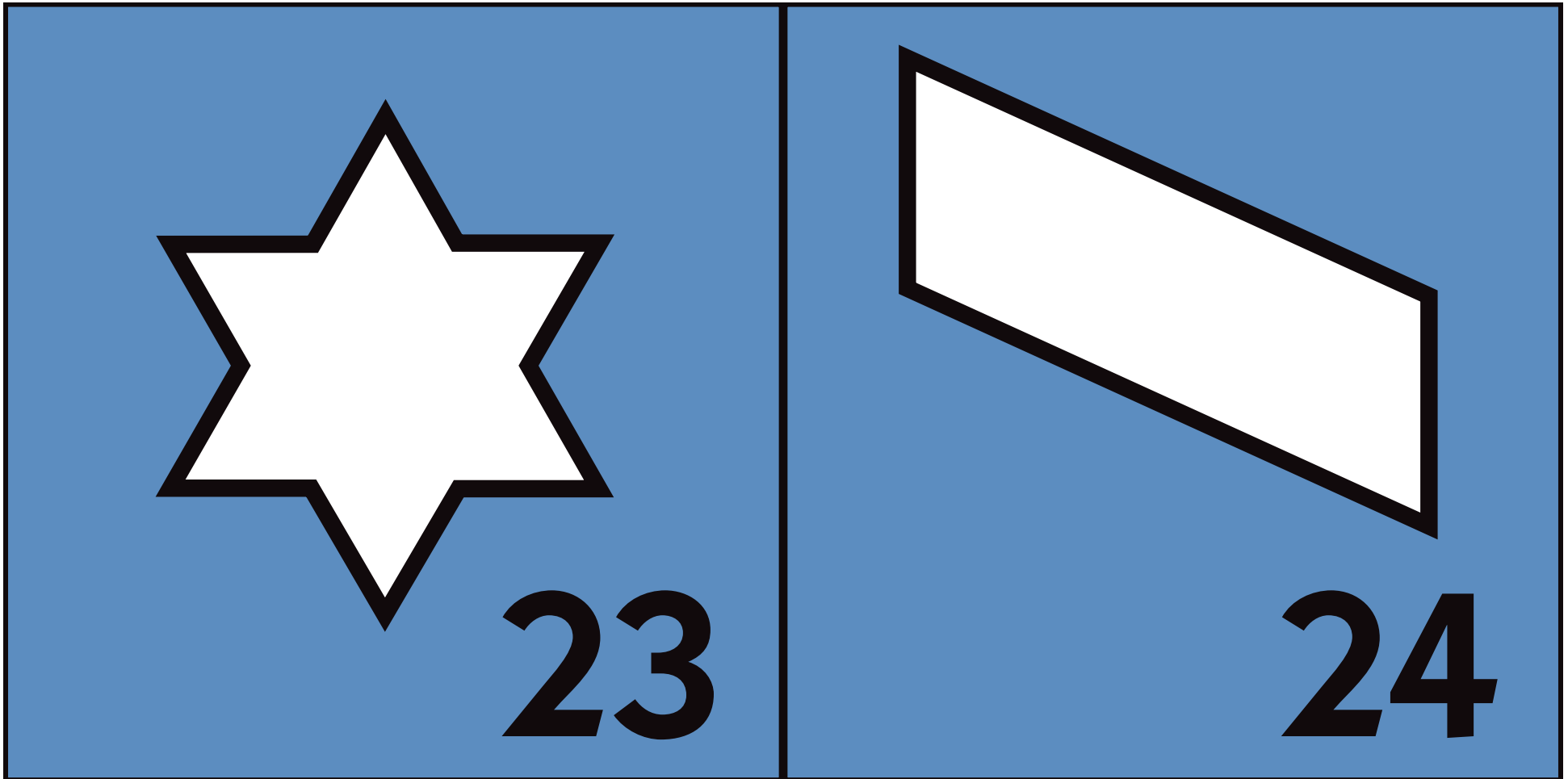
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## December Symmetry Calendar Markers Sheet 12 of 16

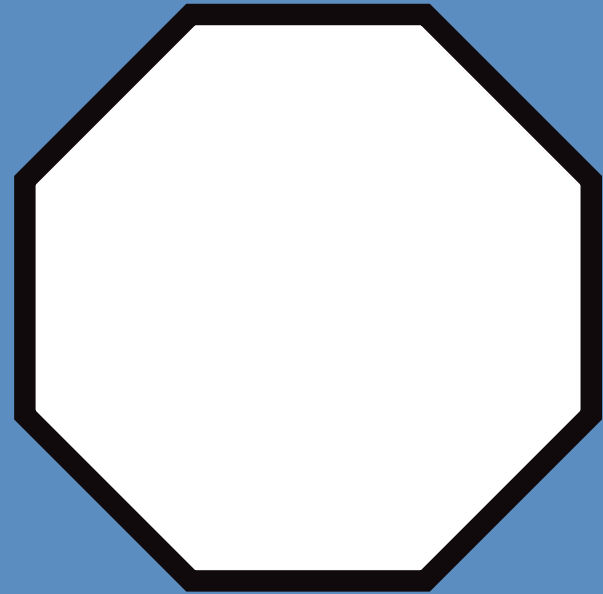


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## December Symmetry Calendar Markers Sheet 13 of 16



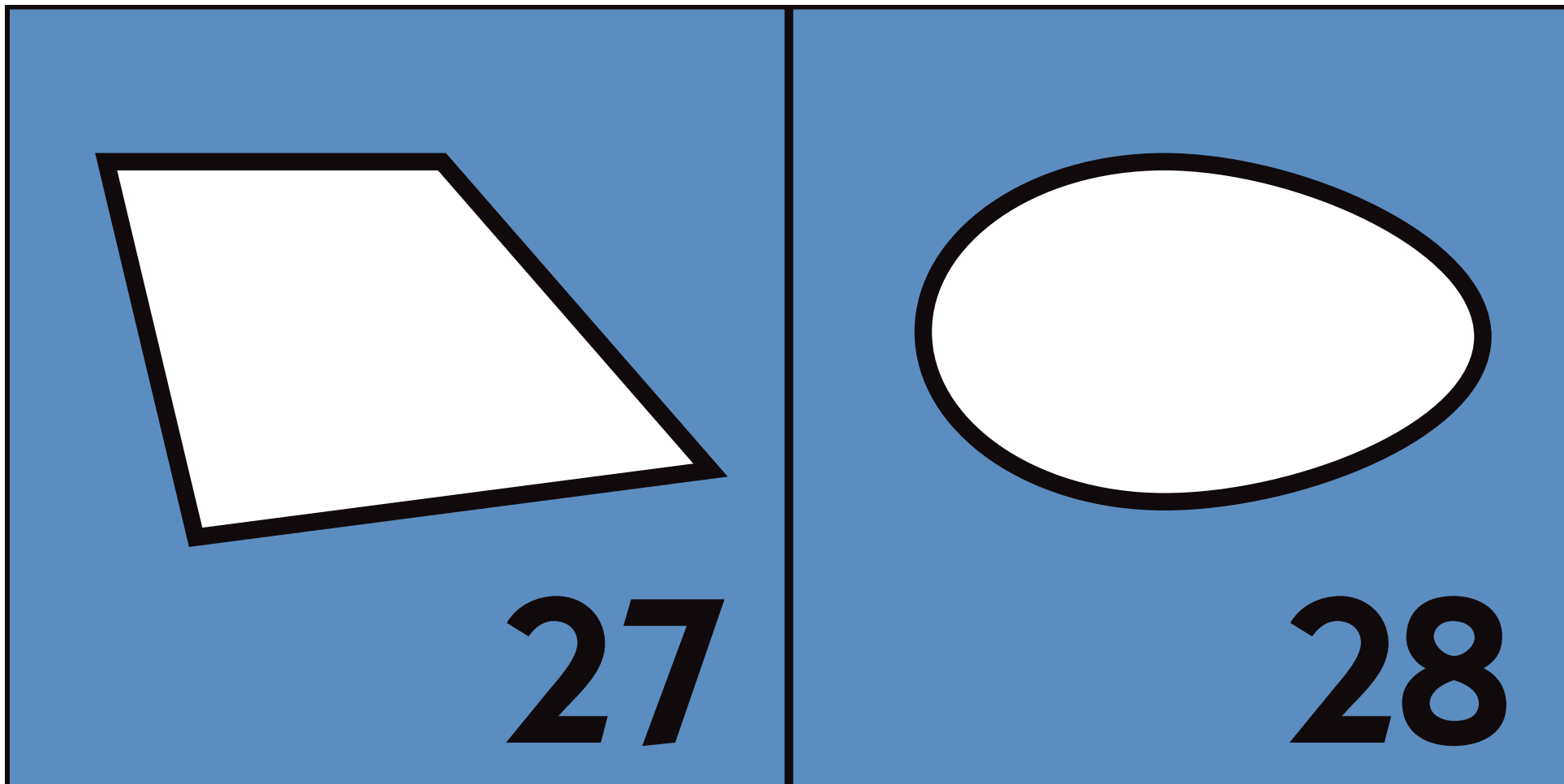
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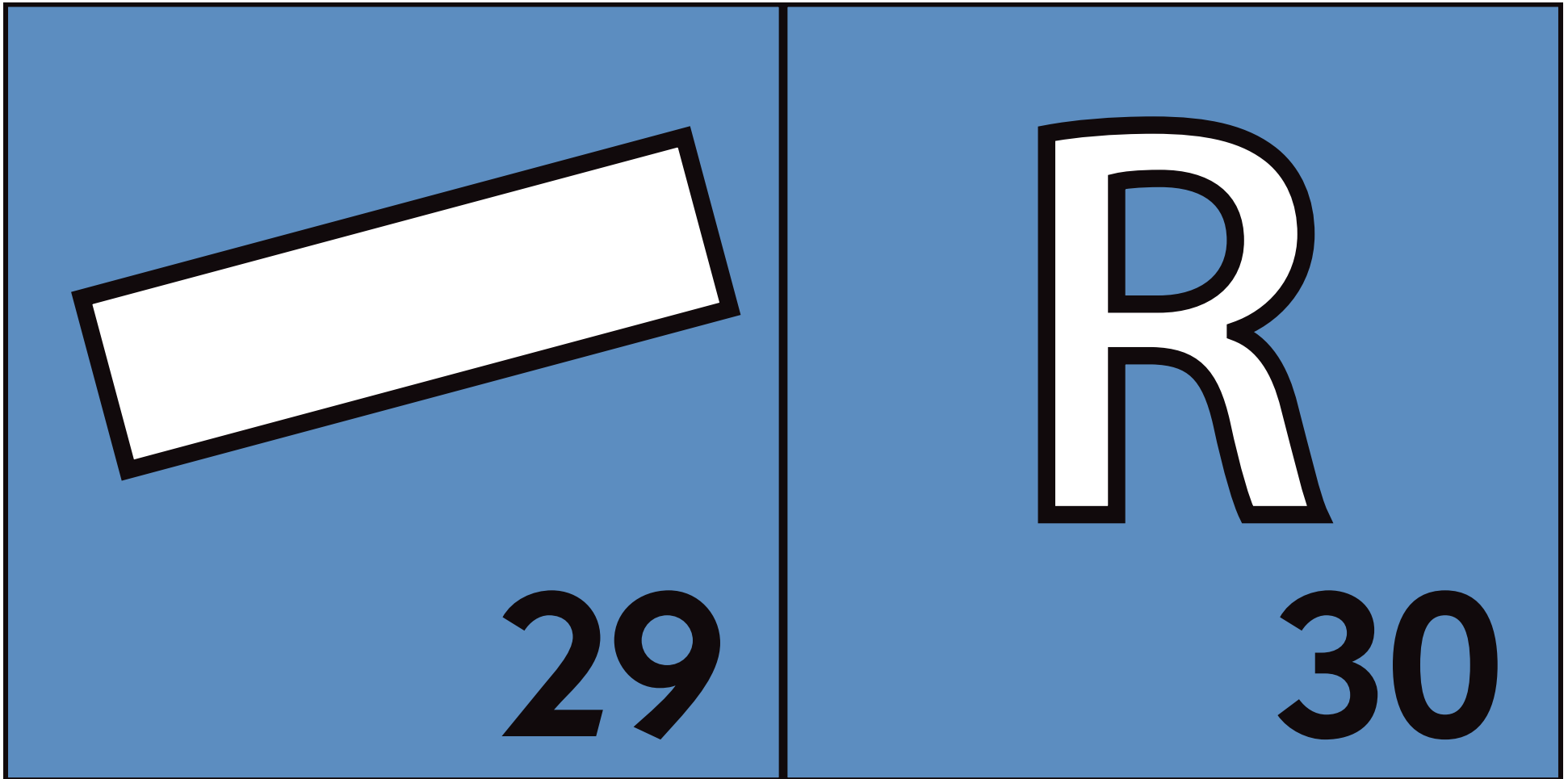
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## December Symmetry Calendar Markers Sheet 15 of 16



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## December Symmetry Calendar Markers Sheet 16 of 16

