Brain Workout Activity Kit
SYMMETRY

Pilot Version — Site Feedback Requested

Age: K-5

Time: 15 min – 1 hour

Materials

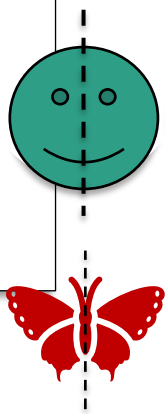
24 Laminated Cards (12 Pre-Printed + 12 Blank)

24 Dry Erase Markers with erasers

Setup

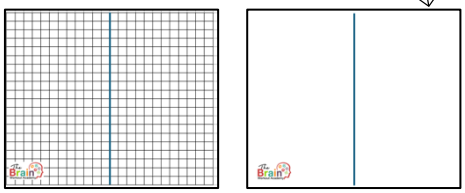
Students work individually or with partners.

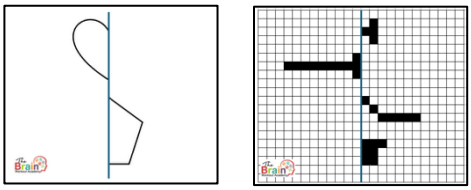
Symmetry is like a **mirror image** or **reflection**. If you draw a line down the center of an object or a shape, both sides should look exactly the same—just flipped. Think of a smiley face or a butterfly's wings. The center line is called the **Symmetry Line.**



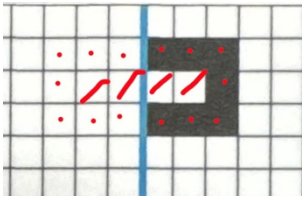
Step-by-step Facilitation

1. Distribute Materials: Each student receives a laminated card (double sided) a dry-erase marker.
   - **Half of the students** get **pre-printed cards.**
   - The other **half** get a **blank card**.





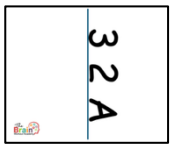
2. Ask students with **pre-printed cards** to:
   - Identify the blue line in the center (Symmetry Line).
   - Draw the exact same shape on the other side of the symmetry line, but make it look like the original shape is looking into a mirror. The design is reflected so it faces the opposite direction.
   - Use the grid to help you by counting the same number of squares on both sides of the Symmetry Line.



Dots indicate squares to be drawn; Lines indicate empty squares.

3. Ask students with **Blank Cards** to:
   - Draw a simple shape or pattern on one side of the blue line.
   - Once finished their half, they can try to complete the mirror image themselves, or swap cards with a neighbor to finish each other's patterns.

Tip: If students are at a loss for what to draw, encourage them to try writing letters or numbers.



4. Reset & Rotate
   - Students wipe clean the laminated cards with the eraser on their marker and trade cards so everyone gets a turn with both the pre-printed cards and the blank cards.

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TIPS FOR SUCCESS

Don't overthink it. You don't need to be a math expert. If the two sides look like they could fold onto each other, they've nailed it! Hand drawn designs will not be exact, especially with a marker tip.

Slide vs. Reflection. When a child copies the shape and simply moves it across the line, they are using a slide or translation. But symmetry requires a reflection — the shape must look like it is being seen in a mirror. To help them you may say: “Don’t slide the shape across. Flip it over the symmetry line, like a pancake” or “The other side should be the shape’s mirror twin.” Encourage children to compare distances from the symmetry line. The reflected part should be the same distance from the line as the original part. The goal is for children to begin seeing that symmetry means same shape, same distance from the line, but facing the opposite way.

Suggest Paper folding activity. Students can fold paper to find the reflection. Provide a cut-out paper shape that has a symmetry line (e.g., heart, triangle, star). They can fold the shape to make the edges align, then unfold to see the fold is the line of symmetry and the two sides cover each other.

Be aware of Developmental Milestone. Some children may not be mentally ready to fully understand reflection symmetry yet, and that is okay. Spatial reasoning develops over time. Some children may enjoy the drawing part of the activity now and understand the reflection idea better after more experience with mirrors, folding, building, and drawing. Do not turn the activity into a struggle. If a child is frustrated or keeps sliding the shape instead of flipping it, let them continue enjoying the drawing and creativity. Coming back to the activity later can make a big difference. A child who is not ready today may be more ready in a few weeks or months.

Celebrate Creativity. There are no wrong designs on the blank cards. This should be fun!

Solutions