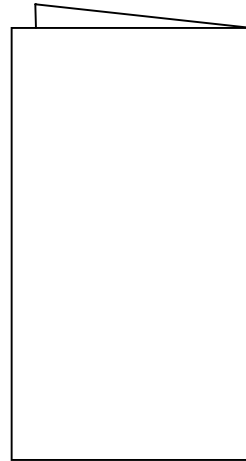
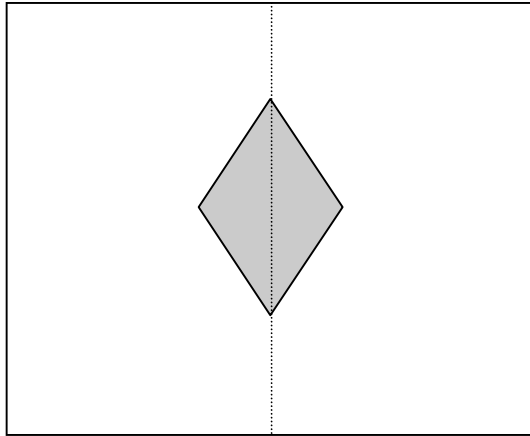


2nd grade**Task 1****Pictures**

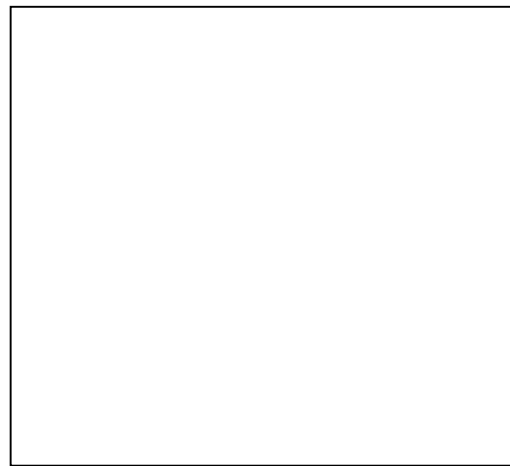
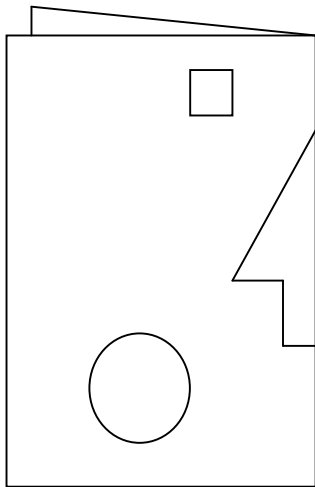
Student Task	Visualize lines of symmetry in a completed picture as well as from a picture that has been folded in half.
Core Idea 4 Geometry and Measurement	Students will recognize and use characteristics properties, and relationships of two-and three-dimensional geometric shapes and apply appropriate techniques to determine measurements <ul style="list-style-type: none">• Identify, visualize, construct and draw two-dimensional shapes according to their attributes and/or parts of their shapes• Show an understanding of line symmetry

Pictures

1. Jacob cut out a rhombus on a line of symmetry. Show what his picture would look like if he folded the paper on the line of symmetry.



2. Laura made a drawing using some shapes and a line of symmetry. She used the folded edge as the line of symmetry. Draw a picture of what the paper will look like when it is unfolded.



Pictures	Grade 2	Rubric	
The core elements of the performance required by this task are: <ul style="list-style-type: none"> • Identify, visualize, construct and draw two-dimensional shapes according to their attributes and/or parts of their shapes. • Show an understanding of line symmetry. 			
Based on these credit for specific aspects of performance should be assigned as follows		points	section points
1. Gives a drawing with: A vertical half of a rhombus on the folded sheet	2	2	
2. Gives a drawing with A tree in center of the rectangular space 2 smaller squares above the tree 2 larger circles below the tree	1 1 1	3	
Total Points			5

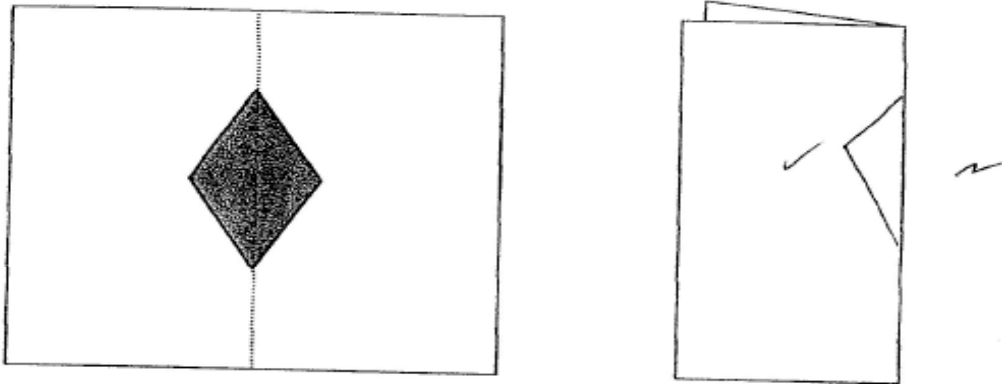
Looking At Student Work – Pictures:

A little less than half of the students could meet all the demands of this task. Student A's paper is reflective of this work. In part one, the half rhombus was drawn in close proximity and similar dimensions to the example. In part two, the circle and square have been repeated on the opened paper. The arrow shape is completed. Many students drew in the fold line on the finished drawing.

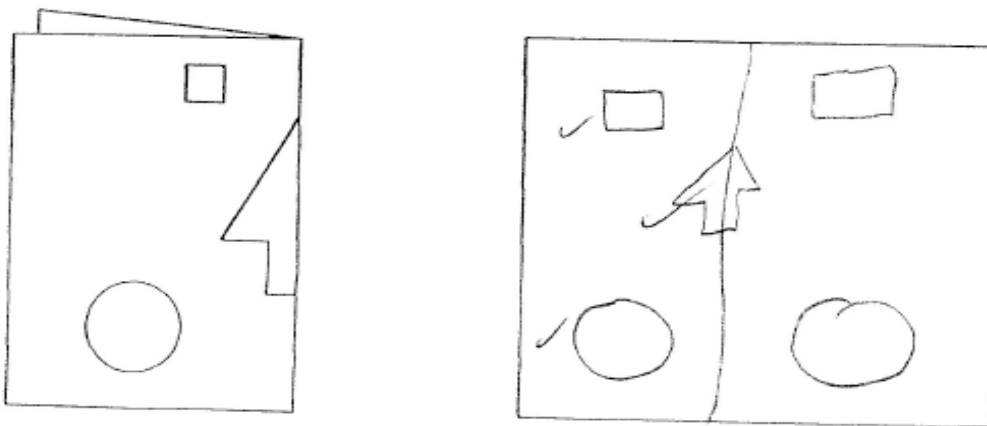
Student A

Pictures

1. Jacob cut out a rhombus on a line of symmetry. Show what his picture would look like if he folded the paper on the line of symmetry.



2. Laura made a drawing using some shapes and a line of symmetry. She used the folded edge as the line of symmetry. Draw a picture of what the paper will look like when it is unfolded.

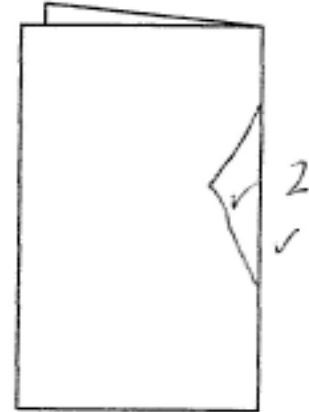
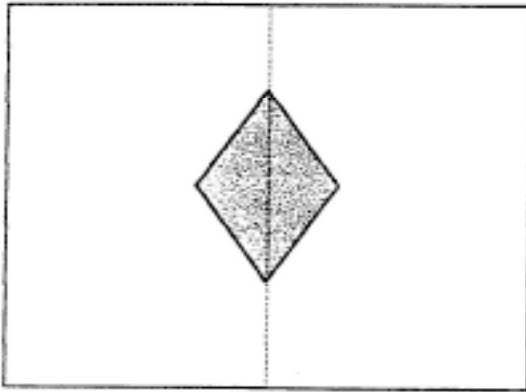


Student B has shown understanding of symmetry except that the square is not mirrored to reflect a symmetrical drawing in part two.

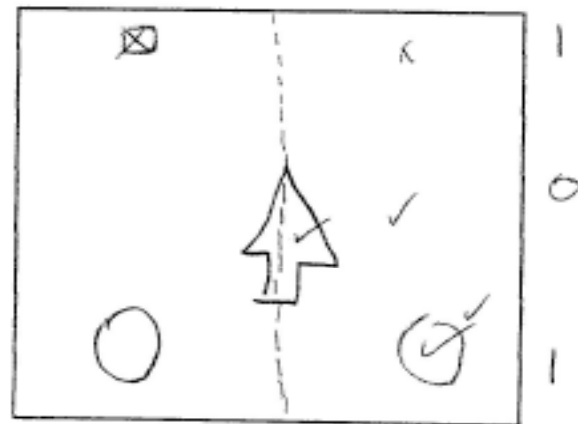
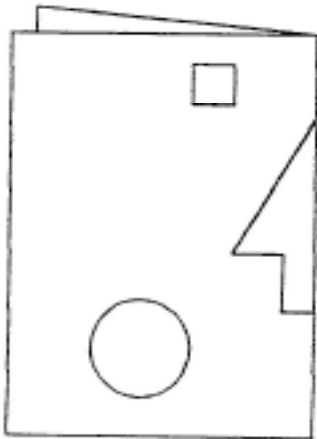
Student B

Pictures

1. Jacob cut out a rhombus on a line of symmetry. Show what his picture would look like if he folded the paper on the line of symmetry.



2. Laura made a drawing using some shapes and a line of symmetry. She used the folded edge as the line of symmetry. Draw a picture of what the paper will look like when it is unfolded.

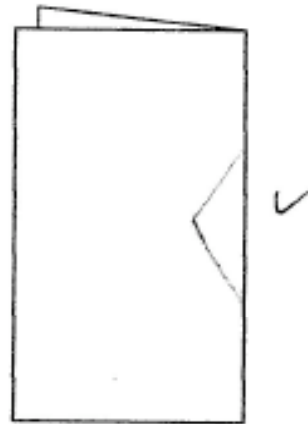
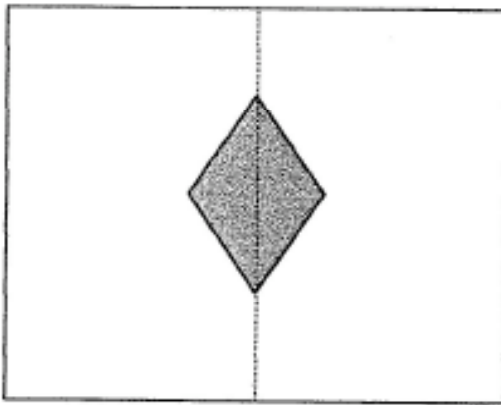


52% of students were unable to correctly complete the entire picture for part two. However, just as we see in the work of Student C, about one half of those students completed the full arrow shape but did not draw a 2nd circle nor a 2nd square. Otherwise, placement and dimensions were correct.

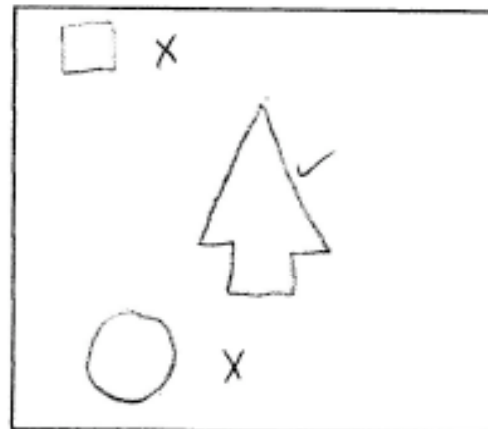
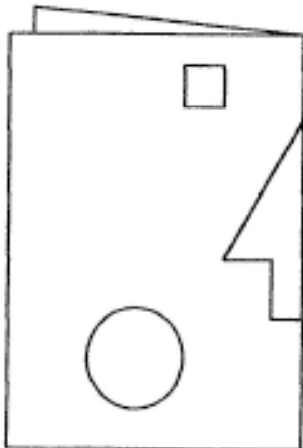
Student C

Pictures

1. Jacob cut out a rhombus on a line of symmetry. Show what his picture would look like if he folded the paper on the line of symmetry.



2. Laura made a drawing using some shapes and a line of symmetry. She used the folded edge as the line of symmetry. Draw a picture of what the paper will look like when it is unfolded.

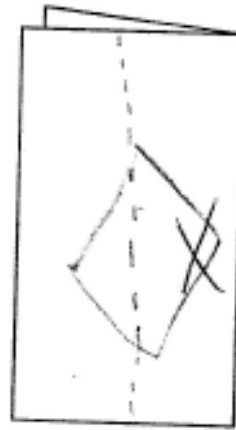
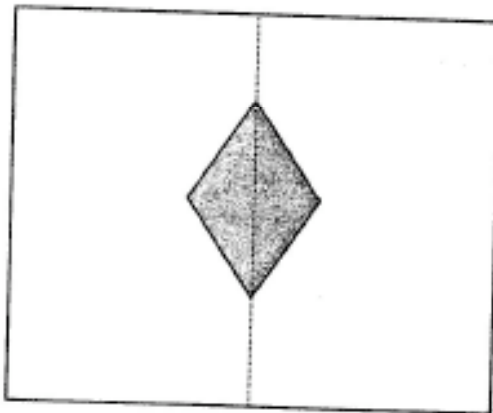


Only 14% of all students were unable to place the half rhombus on the folded paper in part one. Student D moved the entire rhombus off the fold and into the middle of the top of the folded paper.

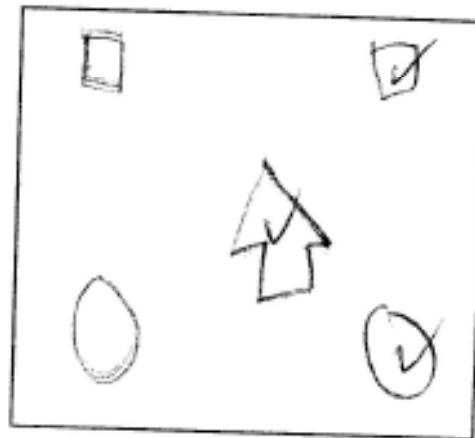
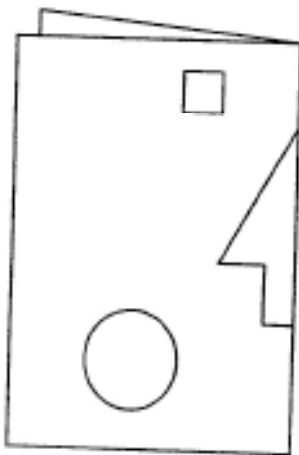
Student D

Pictures

1. Jacob cut out a rhombus on a line of symmetry. Show what his picture would look like if he folded the paper on the line of symmetry.



2. Laura made a drawing using some shapes and a line of symmetry. She used the folded edge as the line of symmetry. Draw a picture of what the paper will look like when it is unfolded.

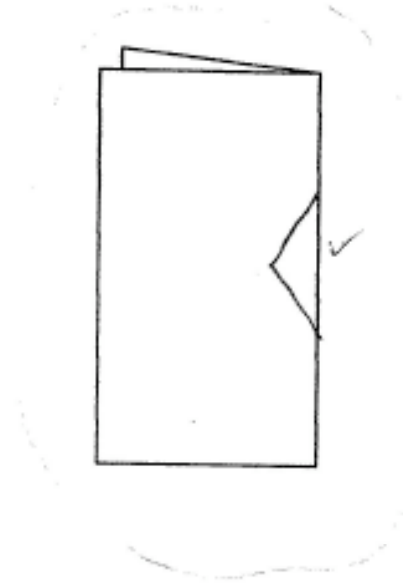
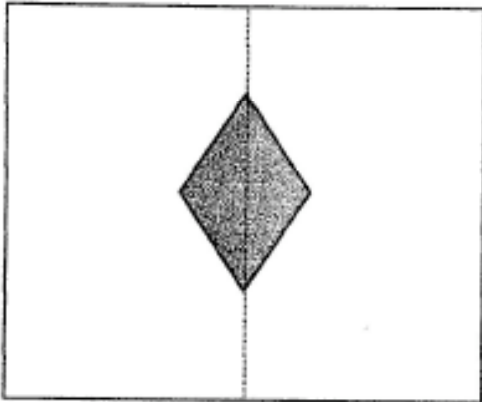


Students E and F encountered difficulty with the 2nd part of this task. Student E was successful with visualizing one half of a shape on a folded paper. Completing a half drawn picture was more of a struggle.

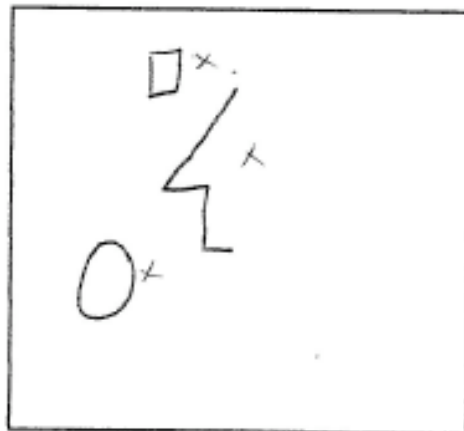
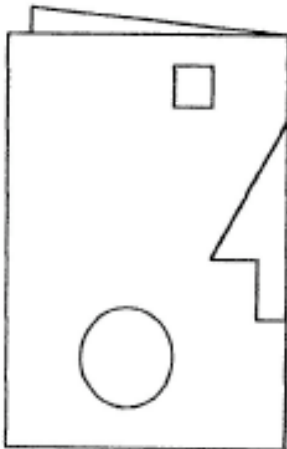
Student E

Pictures

1. Jacob cut out a rhombus on a line of symmetry. Show what his picture would look like if he folded the paper on the line of symmetry.



2. Laura made a drawing using some shapes and a line of symmetry. She used the folded edge as the line of symmetry. Draw a picture of what the paper will look like when it is unfolded.

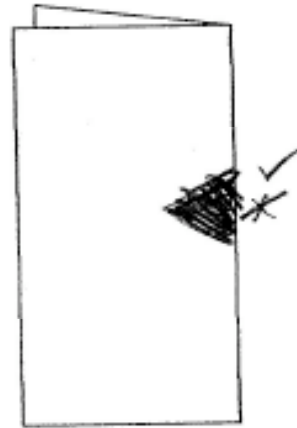
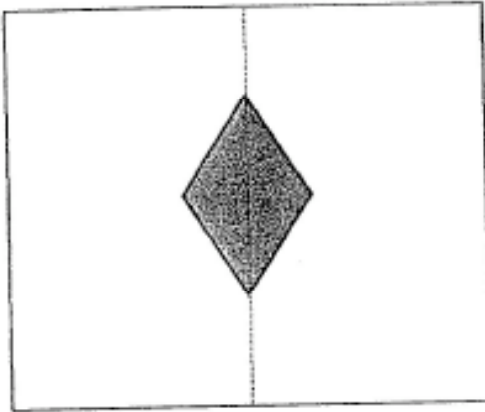


Student F drew all the shapes for the completed picture in part two but did so without correct placement.

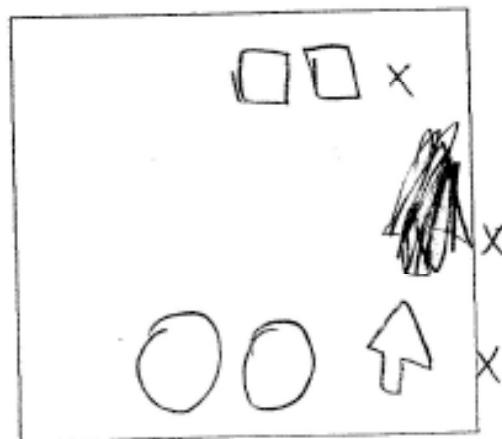
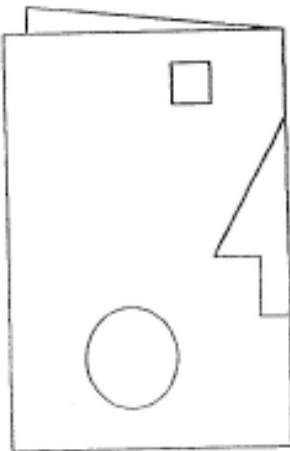
Student F

Pictures

1. Jacob cut out a rhombus on a line of symmetry. Show what his picture would look like if he folded the paper on the line of symmetry.



2. Laura made a drawing using some shapes and a line of symmetry. She used the folded edge as the line of symmetry. Draw a picture of what the paper will look like when it is unfolded.

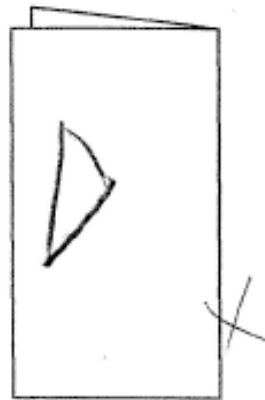
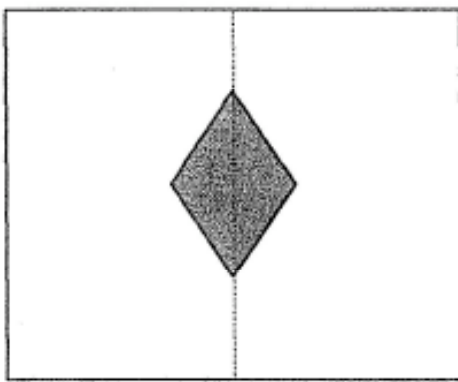


Student G shows a great deal of difficulty understanding symmetry in folded paper drawings. In part one, the student has drawn one half of the rhombus but has rotated the half shape and moved it to the center of the top layer of the folded paper. In part two, the student completed the arrow shape but was not sensitive its placement. The square and the circle were completely ignored.

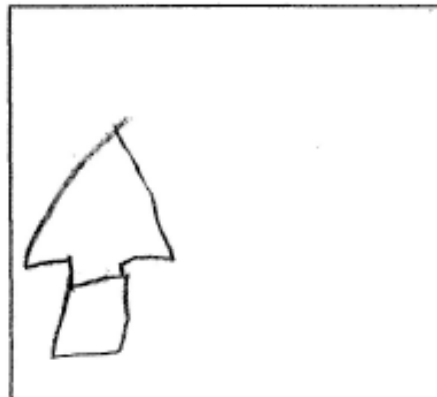
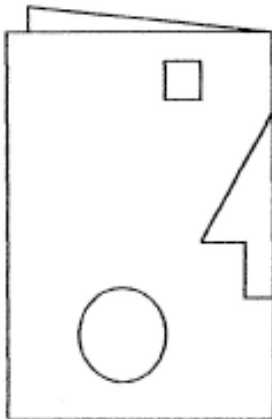
Student G

Pictures

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2. Laura made a drawing using some shapes and a line of symmetry. She used the folded edge as the line of symmetry. Draw a picture of what the paper will look like when it is unfolded.

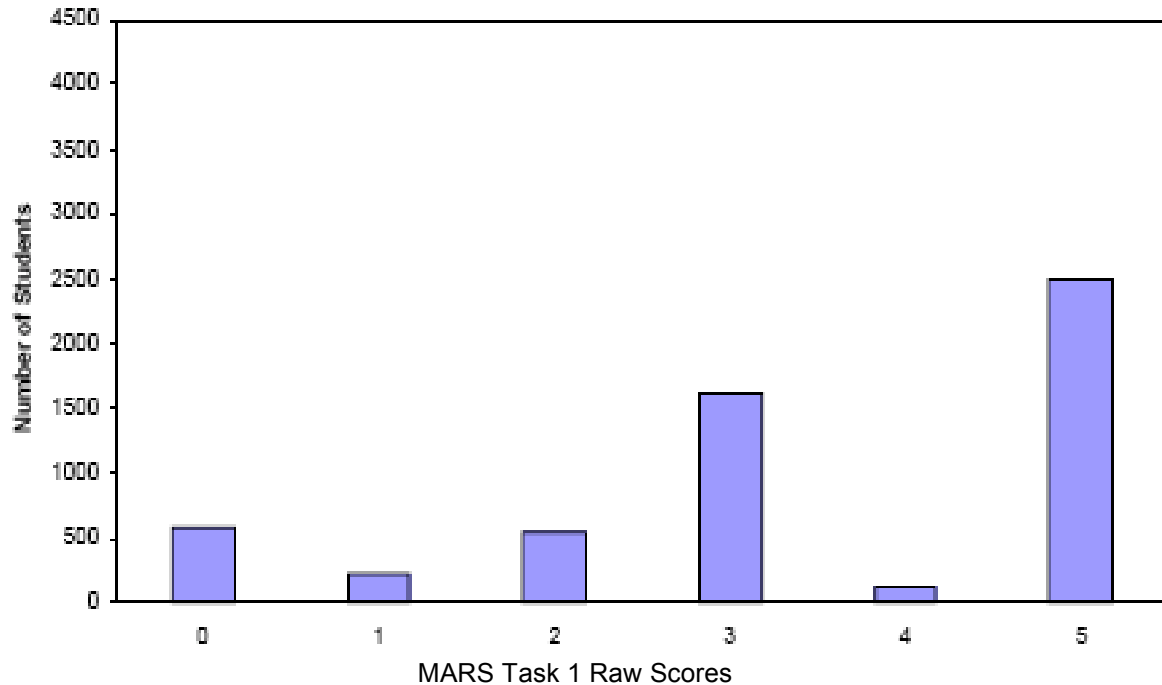


Teacher Notes:

Frequency Distribution for Task 1 – Grade 2 – Pictures

Pictures

Mean: 3.42 StdDev: 1.68



Score:	0	1	2	3	4	5
Student Count	580	228	537	1613	113	2489
% < =	10.4%	14.5%	24.2%	53.2%	55.2%	100.0%
% > =	100.0%	89.6%	85.5%	75.8%	46.8%	44.8%

The maximum score available for this task is 5 points.
The cut score for a level 3 response is 3 points.

Many students (75%) could correctly draw one half of the rhombus on a fold line. Approximately 50% of the students could complete a symmetrically drawn picture when given one half of the drawing. 78% of the students met the essential standards on the task. This task was attempted by all students.

Pictures

Points	Understandings	Misunderstandings
0	100% of the students attempted to solve this task.	Little attention was paid to correct placement of the shapes. The arrow shape was left as half a shape. Many students did not place a second square nor second circle on the unfolded half of the second drawing.
1 – 2	The arrow shape in part two was centered in the middle of the full sheet of paper.	Many students placed the half rhombus shape in the center of the top layer of the folded paper in part one. The 2 nd square and circle were left off the drawing in part two.
3 - 4	The half rhombus shape was drawn and placed correctly. The arrow shape was completed and placed in the center of the part two drawing.	The 2 nd square or circle was not drawn in part two. In less than 10% of these papers, students were unable to provide a correct representation of half of the rhombus on folded paper.
5	Approximately 45% of all students could meet all the demands of this task. Careful attention was paid to shape, size and placement of the shapes.	

Based on teacher observations, this is what second grade students seemed to know and be able to do:

Areas of difficulty for second graders, students struggled with:

- Drawing the 2nd circle and the 2nd square in the unfolded symmetrical design
- Completing the 2nd half of a folded drawing
- Did not understand symmetry if the line of symmetry was not present
- Did not space accurately

Strategies used by successful students:

- Many were able to draw one half of a rhombus on the fold
- Many were able to draw the arrow in the middle of the paper
- Knew that the fold line determined symmetry for the entire picture
- Understood the concept of line symmetry: the line of symmetry divides the design into two congruent halves that are mirror images of each other
- Visualization – they drew it out both in their minds and on the paper

Questions for reflection on Pictures

- What experiences have your students had to explore symmetry with cut paper designs?
- What do they notice? What do they comment on?
- Can they predict what will happen as a result of cutting paper?
- Do they seem intentional when they cut or are they surprised at what they create?
- Are they simply exploring or do they attempt to figure out what is happening?
- Can they tell why they think some things are possible but not others?
- What kinds of language do they use to describe designs before and after they cut?
- Can they replicate what they have done?
- How simple or complex are their designs?
- Can they describe the steps they took to make cut paper designs?
- Can they tell how one design arrangement is different from another?

Teacher Notes:

Implications for Instruction:

A line of symmetry divides a plane shape or design into two congruent (identical) parts. It is important to guide students to recognize, describe, and informally prove the symmetric characteristics of designs through the materials that teachers supply and by the questions that are asked. Pattern blocks, geoboards, paper cutouts, and paper folding can give students experiences that will strengthen their spatial visualization. For our children, the use of mirrors will show a reflected image as the second half of a symmetrical design. These are some of the ways to help students create or complete symmetrical images. First we ask them to “see” what the image looks like, then we ask them to create the image on their own. Our curriculum textbooks can supply students with activities for finding and marking lines of symmetry on pre-drawn shapes. This may help students to understand what a shape will look like when it is folded. Student activities should also include folding and cutting paper and predicting what the results will be from the folds and cuts. Begin with one fold and one cut and ask students to draw a prediction of what will happen when the paper is unfolded. Verifying the result may solidify understanding as well as give beginning students the necessary opportunity to learn as they work. Spatial visualization and reasoning are areas in which most students need more and varied opportunities to learn. In the study of shape, our goals are to discover similarities and differences among objects and shapes, to analyze the components of form and to

recognize shapes in different representations. Our job is to help our students build a geometry tool box that will strengthen their ability to classify, analyze, and represent two- and three-dimensional shapes.

Teacher Notes:
