

Lesson Plan-- Axisymmetric Figures

Supervisor: Dr LAM Bick Har

Date: 14/11/2020

Duration: 60 mins

Class: P4

No. of Students: 24

Topic: Axisymmetric Figures (2)

Prerequisite knowledge:

1. Students know the definition of axisymmetric figures-- the left and right sides of the graph overlap completely, then the graph is axisymmetric, and this line is its axis of symmetry.
2. Students could determine whether a given figure is an axisymmetric graph.
3. Given an axisymmetric graph, students can draw all the axes of its symmetry.

Teaching goals:

1. Students can make axisymmetric figures by paper cutting and watercolor folding, and indicate the axis of symmetry of figures.
2. Students can find the symmetry point of a given point on the pin board by counting lattice points.
3. Students can make axisymmetric graphics on the pin board by connecting the corresponding symmetric points and apply it in GeoGebra.
4. Students can identify each role and responsibility during group work.
5. Students can apply what they have learned into life and give examples of axisymmetric figures in real life.

Teaching Materials:

Square paper, scissor, watercolor, feedback form, GeoGebra, worksheet

Teaching flow (60 min.)

Teaching flow/ Strategy	Teaching Content	Teaching materials	Time
1.Class Activity	1. Teacher plays a video clip about the axisymmetric figure on.	https://www.hkedcity.net/etv/resource/10	7mins

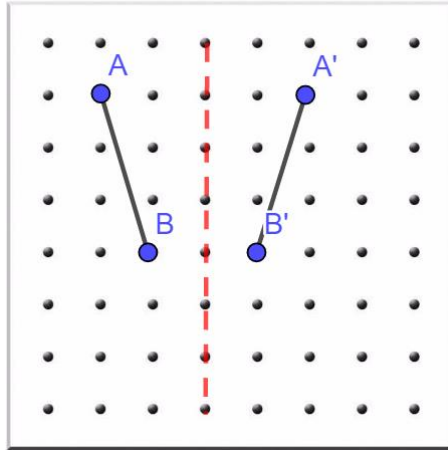
	<p>2. After realizing the video, the teacher shows the created axisymmetric figure and asks the student to find out the symmetry axis.</p> <p>Teacher asks: What are the characteristics of axisymmetric figures?</p> <p>3. The teacher concludes, then whether paper-cutting or watercolor folding is used, the symmetry axis of the obtained figure is the crease of square paper.</p>	01054165	
2. Discussion	<p>1. The teacher divides the class into groups of 3-4 people (mix abilities grouping.) Total 6 groups.</p> <p>2. The teacher guides students to discuss the pros and cons of the above two methods (paper-cutting and watercolor folding). Teacher write down the result on the board. And asks students to choose one of the methods to make axisymmetric figures.</p> <p>(One possible result: For paper-cutting, it is convenient to draw profile on paper and then cut them with paper cutting. For watercolor folding, we can use different colors to get more colorful graphics.)</p>		8mins
3. Practice	The teacher divides the class into groups of 3-4 people (mix abilities grouping.)	Square Papers	15 mins

<p>Students practice time.</p>	<p>Teacher: “I believe that all of you have some basic understanding about the two methods and characteristics of the production of axisymmetric graphics. Then, you can try to use the method in the video to make your own axisymmetric graphics.”</p> <p>2. The teacher allocates several pieces of square paper, scissors, watercolor and other tools to each group.</p> <p>Teacher: “According to the grouping just now, one member from each group comes to front and get the materials—square papers, scissors, watercolor and your worksheet.”</p> <p>3. Ask student to create their own axisymmetric graphics, Student can use any method to do that. Then submit works as a group.</p> <p>Teacher: remind students to pay attention to paper folding must be completely overlapped.</p> <p>To brought out the characteristics of axisymmetric graphics, so as to avoid confusion between axisymmetric and centrosymmetric graphics.</p> <p>4. Collect and display the works of each</p>	<p>(Many) Scissors (6) Watercolor (6set) Worksheet</p>	
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	<p>group, each group should simply introduce their work, then conduct voting activities with one- person-one-vote for the whole class (you cannot vote for your own group), and give the group with the highest number of votes (candy) as a reward.</p> <p>The abstract mathematical concept of symmetrical graphics is transformed into objective things (students' works) to remind students to pay attention to the attributes of symmetrical graphics. By observing the symmetry phenomenon, we can help them understand the concept of symmetry.</p>		
<p>4. Presentation +Feedback</p>	<ol style="list-style-type: none"> 1. Each group has 3 mins to present. 2. Students write the comment on feedback form to their groupmate and themselves, check each other's three methods of making axisymmetric figures. 3. Teachers conclude all groups' performance. 	<p>Feedback form</p>	<p>13 mins</p>

5. Jigsaw

1. Teacher presents the method of making a symmetric figure in the pin board by



using GeoGebra:

Teacher: First we have a given point A and draw line i as an axis of symmetry. If point A is two grids to the left of the axis of symmetry, then A' is two grids to the right. we could find the symmetric point B' of point B, then connect point A' and B' . $A'B'$ are the symmetrical segment of AB . So, we could complete an axisymmetric figure by connecting the corresponding symmetric points one by one. If a point is on the axis of symmetry, then its point of symmetry is itself.

2. Teacher divides the class into six-student groups which are expert groups (mix abilities grouping, total four groups in the class).

GeoGebra:

<https://www.geogebra.org/classic/pfkdczji>

Worksheet




15 mins




	<p>3. Teacher assigns different problems for every expert group to make symmetric figures by GeoGebra:</p> <ul style="list-style-type: none"> a. when the axis of symmetry is horizontal b. the axis of symmetry is vertical c. the axis of symmetry is tilted, d. axisymmetric graph with two axes of symmetry. <p>4. Students need to complete the exercise in the expert group.</p> <p>5. Teacher rearranges students into new four-student groups (total 6 groups in the class) which are jigsaw groups.</p> <p>Teacher: There are total six groups in our class, each jigsaw group has four students from different expert groups. Each member should teach others what they have learned in the expert group.</p> <p>6. Teacher tells the students how to make an axisymmetric figure on the GeoGebra and let them check their learning outcomes by using the function of GeoGebra.</p> <p>Teacher: If we have half of an axisymmetric figure and the axis of symmetry, we could get an axisymmetric figure by using “reflect object in line” -- Select the object to reflect then select the</p>		
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	line.		
6. Conclusion	Teacher concludes the three methods of making axisymmetric figures and gives the homework.		2 mins

Feedback form

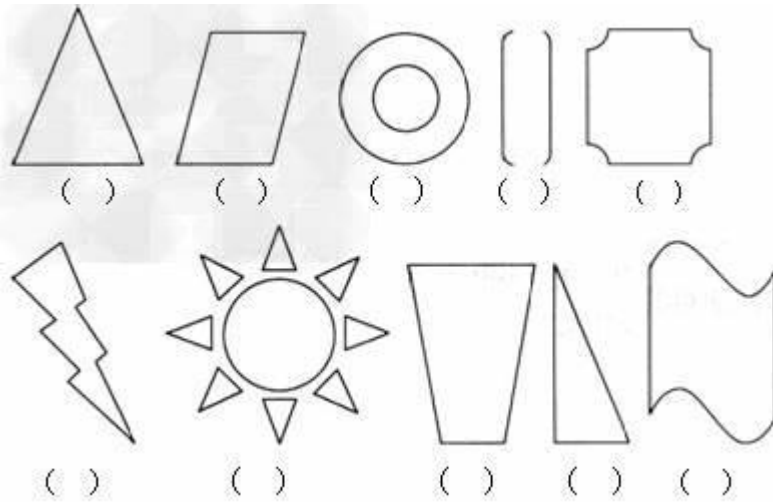
Please click the boxes.

Content	Excellent 	Good 	Need improve 
The symmetry axis is pointed			
Variety in style- Different axisymmetric figure			
Accuracy on explanation of axisymmetric figure			

Presentation	Excellent 	Good 	Need improve 
Organization- Intro, body, and conclusion			
Voice volume & Eye content			
Maintains focus on axisymmetric figure			
Creativity- presentation style and the shape of axisymmetric figure			

Worksheet

Write down the number of symmetry axis of following figures



Write down the pros and cons of two methods of making axisymmetric figures.

	Paper cutting		Watercolour drawing
Pros		Pros	
Cons		Cons	

Draw the completed axisymmetric figures:

