Five daily lessons

Unit 6
Shape and Space

Year 3
Summer term

Unit Objectives

Year 3

• **Identify** and sketch **lines of symmetry, recognise shapes with no line of symmetry**.	Page 85
• Sketch reflection of simple shape in a mirror.	
• Read and begin to write the vocabulary of position, direction and movement.	Page 87
• Recognise that a straight line is two right angles.	Page 89
• Compare angles with a right angle, saying whether they are more or less.	
• Investigate general statements about shapes, and suggest examples to match them. Explain reasoning.	Page 65

Link Objectives

Year 2

- Begin to recognise line symmetry.
- **Use mathematical vocabulary to describe position, direction and movement**.
- Recognise right angles.
- Give instructions to move along a route.
- Visualise objects in given positions.
- Investigate a general statement about shapes.

Year 4

- Sketch reflection of simple shape in a mirror.
- Read and begin to write the vocabulary of movement.
- Make and describe patterns involving translation.
- Begin to measure angles in degrees.
- Know whole turn, 360°, 4 right angles; quarter turn, 90°, 1 right angle; half turn, 180°, 2 right angles.
- Recognise 45° as half a right angle.
- Investigate general statements about shapes.

(Key objectives in bold).

North West Consultants

This Unit Plan is designed to guide your teaching.

You will need to adapt it to meet the needs of your class.

Resources needed to teach this unit:
Resource sheets:
6.1 to 6 .10

Large mirror
Set of small mirrors
Scissors
Paper

Optional use of:
OHP
Area ITP
Symmetry ITP
Geo-strips or card strips

Planning Sheet	Day 1	Unit 6 Shape and Space	Term: Summer	Year Group: 3
Oral and Mental		**Main Teaching**		**Plenary**
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
		Sketch the reflection of a simple 2D shape in a mirror line along one edge, using a mirror to help complete it. **VOCABULARY** line of symmetry symmetrical mirror line reflection fold match **RESOURCES** Resource sheets: 6.1 6.2 6.3 mirrors paper scissors	Show the children selection of shapes/pictures. (See Resource sheet 6.1). Ask the children to discuss with a partner: • Which of these shapes has a line of symmetry/is symmetrical? • What do we mean when we say a shape is symmetrical? • How can we check whether a shape is symmetrical? Discuss what 'symmetrical' means and how we can check if a shape/picture is symmetrical by folding or using a mirror. Remind children that a mirror image or reflection is the reverse or 'flip' of the original. Show how to fold and cut a sheet of paper to create a symmetrical shape. Open the shape and identify the line of symmetry or mirror line. Look at how the two sides match when the paper is folded again. Draw some patterns on one side of the shapes and invite children to reflect them in the mirror line. Discuss how we can do this. Draw half of a shape or picture with a mirror line on one edge on the whiteboard or OHP and invite children to come and complete the picture. Explain and show how a mirror could help. Ask the children to: • Create some symmetrical shapes by folding and cutting and then add symmetrical patterns and/or • Complete symmetrical pictures (see Resource Sheet 6.2).	Ask children to explain how we can check if a shape is symmetrical. Show some of the folded shapes made by the class and discuss whether they are symmetrical. Look at a selection of road traffic signs (see Resource sheet 6.3) and ask children to identify which have a line of symmetry. By the end of the lesson children should be able to: • Identify a line of symmetry in a simple shape. • Explain how to check that a shape has line symmetry. • Complete a simple shape to make it symmetrical.

Planning Sheet	Day 2	Unit 6 Shape and Space	Term: Summer	Year Group: 3
Oral and Mental		**Main Teaching**		**Plenary**
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
		Recognise shapes with no lines of symmetry. Reason about shapes. **VOCABLARY** line of symmetry symmetrical mirror line reflection fold match **RESOURCES** Resource sheets: 6.4 6.5 Optional: OHP Symmetry ITP Area ITP	Show the class part of a shape on a square grid with a mirror line marked. Use Resource Sheet 6.4, enlarged or shown on the OHP or create the shapes on the Symmetry ITP. Invite children to reflect the shape in the mirror line. Check with the reflect tool if using the ITP. (Children could all be involved by using wipe clean blank grids with a mirror line drawn on). Show a selection of shapes created on the Area ITP (or use Resource Sheet 6.5 enlarged or on the OHP). These shapes all require the addition of one square to make the shape symmetrical. Choose **one** of the shapes and ask the children to discuss with their partner how it could be made symmetrical by adding one square. • How can we make this into a shape that has a line of symmetry? • Where could we place the additional square? • Is there more than one way to do it? • Can you draw the line of symmetry? • Does the shape have more than one line of symmetry? Give children a copy of Resource Sheet 6.5. Ask them to work with a partner to make the rest of the shapes symmetrical by adding one square and to draw in the mirror line. Can they see more than one solution for any shapes? Is there more than one line of symmetry for some solutions? Children could be given a copy of the sheet in a plastic pocket to test their ideas with a dry wipe pen. Ask those who finish to create some shapes of their own that are 'nearly symmetrical' to challenge the rest of the class in the plenary.	Use the ITP Area or Resource Sheet 6.5 enlarged or on the OHP. Invite children to show how they changed the shapes and to identify the line of symmetry. Invite some children to create their own shapes on the board for others to complete. How did you create a shape that is not quite symmetrical? By the end of the lesson children should be able to: • Complete a simple shape to make it symmetrical. • Recognise shapes with no lines of symmetry.

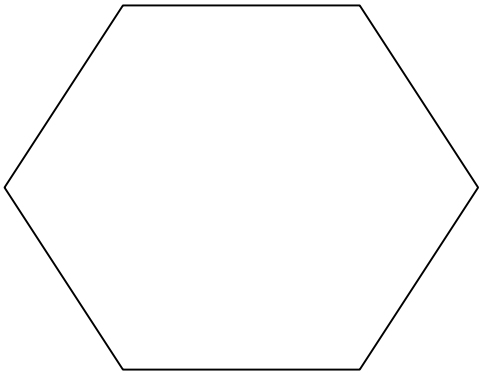
Planning Sheet	Day 3	Unit 6 Shape and Space	Term: Summer	Year Group: 3
Oral and Mental		**Main Teaching**		**Plenary**
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
		Recognise and sketch more than one line of symmetry. Reason about shapes. **VOCABULARY** line of symmetry symmetrical mirror line reflection fold match pattern **RESOURCES** Resource sheets: 6.1 6.6 6.7 Optional: OHP Area ITP	Remind the children that some shapes can have more than one line of symmetry. Look at Resource Sheet 6.1 again. Ask children to identify which shapes have more than one line of symmetry. Remind the class how we created a shape with one line of symmetry by folding and cutting. How could we create a shape with two lines of symmetry? Show the children how to fold the paper twice and then cut to create a shape with two lines of symmetry at right angles. Unfold the shape and identify both lines of symmetry and fold along each one to show how the sides match. Cut some more shapes. Some children could be invited to add patterns to the shape and reflect them in both mirror lines. Ask the children to: • Create some shapes with two lines of symmetry by folding and cutting paper and/or • Identify patterns; shapes etc with more than one line of symmetry (see Resource Sheet 6.6).	Look at some of the shapes created and the lines of symmetry identified on Resource Sheet 6.6. Use Resource Sheet 6.7 or the Area ITP to create shapes that need one square adding to have two lines of symmetry. • Does this shape have a line of symmetry? • Can you see how to add a square to this shape to change it so that it has two or more lines of symmetry? • Can you draw the lines of symmetry? By the end of the lesson children should be able to: • Identify shapes with more than one line of symmetry.

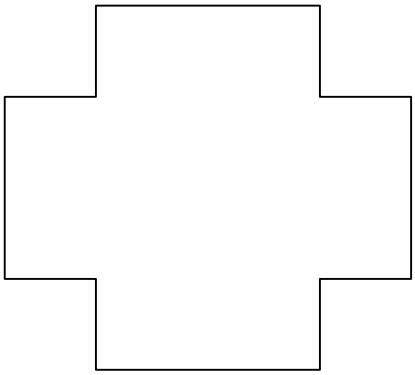
Planning Sheet	Day 4	Unit 6 Shape and Space	Term: Summer	Year Group: 3
Oral and Mental		**Main Teaching**		**Plenary**
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
		Read and begin to write the vocabulary of position, direction and movement. Investigate general statements about shapes and suggest examples to match them. Explain reasoning. **VOCABULARY** square shape right-angle finder Geo-strips or card strips **RESOURCES** Resource sheets: 6.8 6.9 small counters OHP	Show the children a square, drawn on the board or from a set of shapes. Ask: "Why is this shape a square?" Agree that it is a square because it has: • Four straight sides of equal length. • Four right angles. Check the children's understanding of a right angle by folding paper to make a right angle and using two geo-strips or card strips to show a quarter turn and explain that this creates a right angle. Show Resource Sheet 6.8 enlarged or on the OHP. Why are the rows and columns on this grid labelled? Agree that this lets us describe the position of any square on the grid and remind children of the order in which we read the labels. Place counters on the grid and ask: • What is the position of this square? Eg. B4 • Which square is two places to the left of C3? • Which square is three places below D4? Etc. Ask someone to suggest how to locate 4 counters so that they lie at the four corners of a square. Repeat so that a range of examples are given. Encourage children to think of squares that are not in the familiar orientation. (See Resource Sheet 6.9 for examples). How do we know these counters lie at the four corners of a square? How can we check? Ask children to take turns to call out a position where they would like you to place a counter on the grid. Tell them you are looking to see if any four counters form a square and that they are trying to place as many counters on the grid without four of them lying at the corners of a square. Could we place a counter here? Why not? Which other counters will it form a square with? When children think they cannot place any more counters check each empty square on the grid to see why it cannot be filled. Let children play the game in pairs. Player A instructs Player B which position to place counters using grid labels eg B3. Player A continues until Player B sees that four of the counters lie at the corners of a square. Player A counts up how many she/he has been able to place and then the players swap over. Who can place the most counters?	Put the blank grid on the OHP and place a counter in one square. If I keep this counter in place, in which other positions could I place counters so that they form a square with this one? Ask children to say the positions. Look for all the different possible squares. Try different places to place the first counter. Where is the best place to put the first counter to be able to create the most squares? By the end of the lesson children should be able to: • Identify the position of a square on a grid. • Visualize a square in different orientations. • Explain their reasoning.

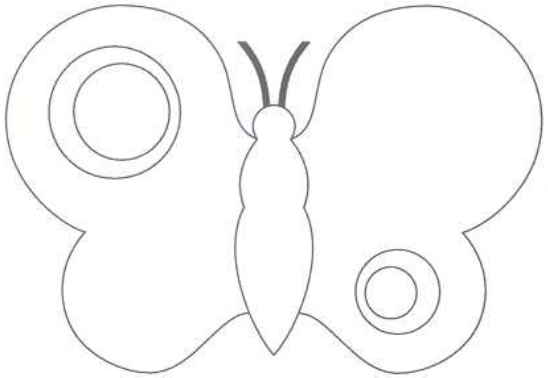
Planning Sheet	Day 5	Unit 6 Shape and Space		Term: Summer	Year Group: 3
Oral and Mental		**Main Teaching**			**Plenary**
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**		**Teaching Activities/Focus Questions**
		Recognise that a straight line is two right angles. Compare angles with a right angle, saying whether they are more or less.	Remind children that one of the ways they identified squares in the previous lesson was to check for right angles. Use the folded paper and geo-strips to show a right angle again. If I turn the geo-strip through another right angle what will it look like? Demonstrate that the strips will form a straight line. Put two angle finders made from folded paper or two square shapes together to form a straight line. If a right angle is made from a quarter turn what sort of turn makes a straight line? Agree that it is made from two quarter turns or a half turn. Ask the children to stand up and follow instructions such as: • Turn clockwise through one right angle. • Make two quarter turns to the left. • Make a half turn anti-clockwise. Remind children of any directional language as necessary and check that they understand that after turning through half a turn, or two quarter turns in the same direction, you are facing the opposite direction. Draw some angles on the board or OHP or create them with geo-strips. Is this angle greater or less than a right angle? How can we check? Show children how to check using a right angle template made from folded paper. The children could: • Identify angles that are greater or less than a right angle (See Resource Sheet 6.10) and/or • Create different shapes on a geo-board and identify whether the angles are right angles or greater/less than a right angle.	Draw a large arrow on the board or use a cardboard cut out arrow. Draw or place a selection of similar arrows in different positions. Ask: If I turn my arrow clockwise through one right angle which of these arrows shows its new position? Etc. Turn the arrow in a range of ways and ask the children to describe the turns as 'one right angle clockwise', 'a half turn to the left', 'less than one right angle to the right' etc. By the end of the lesson children should be able to: • Say whether an angle is more or less than a right angle? • Show that two right angles make a straight line. • Use appropriate language to describe turning movements.

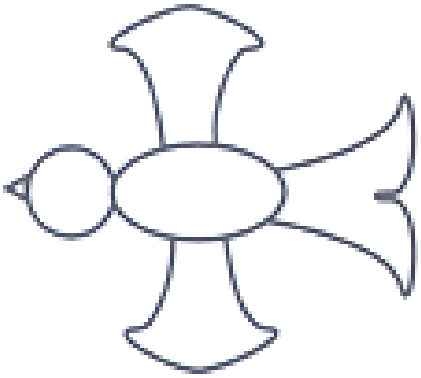
LINES OF SYMMETRY

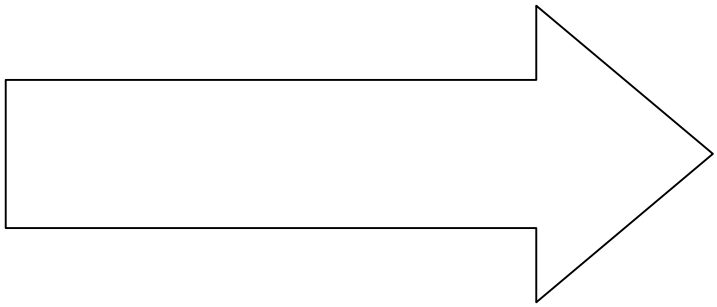
RESOURCE SHEET

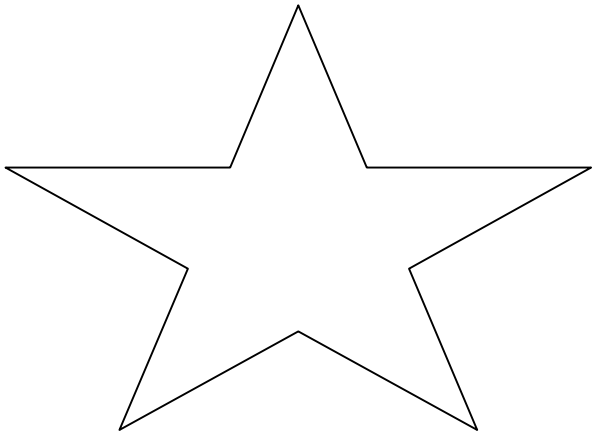












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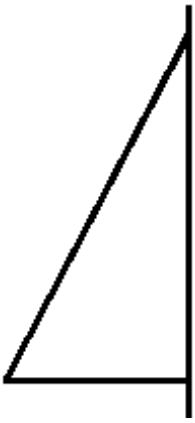

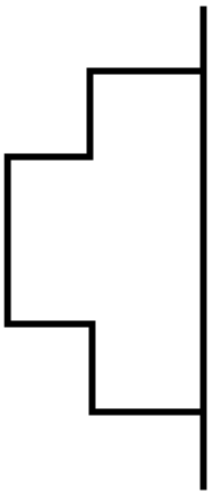

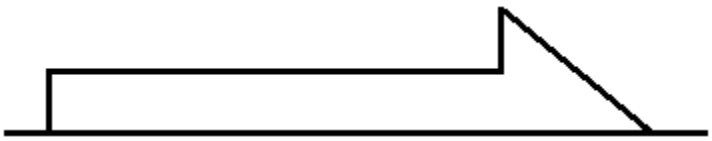

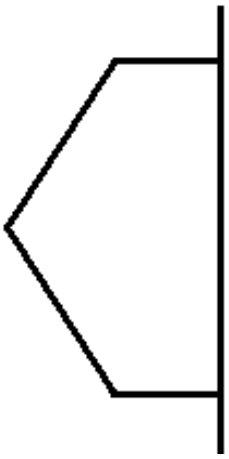

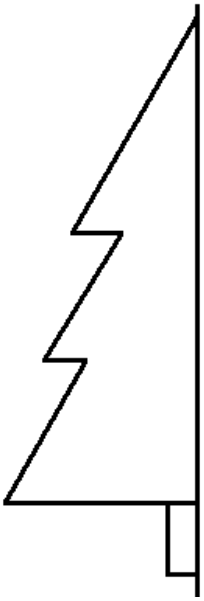

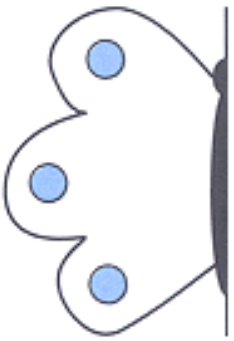

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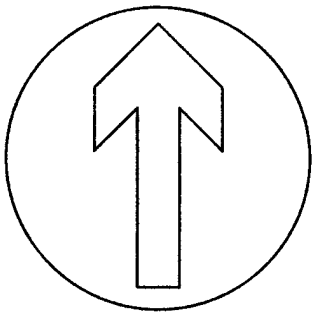

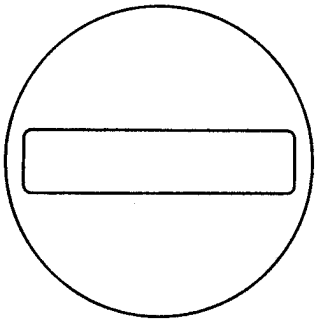

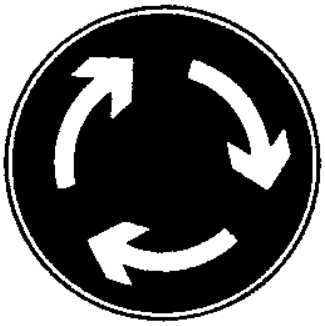

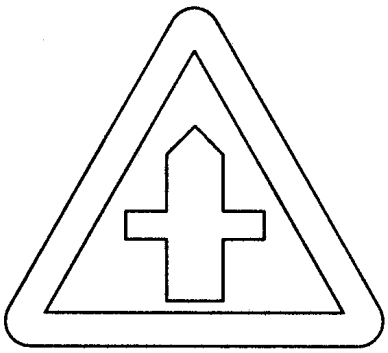

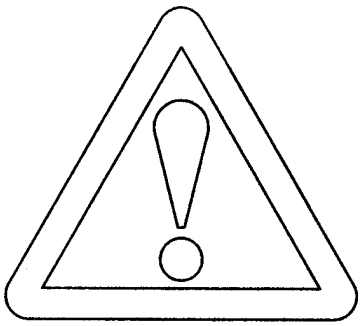

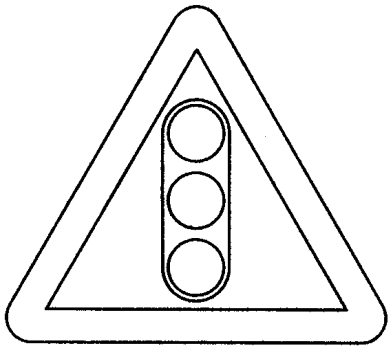

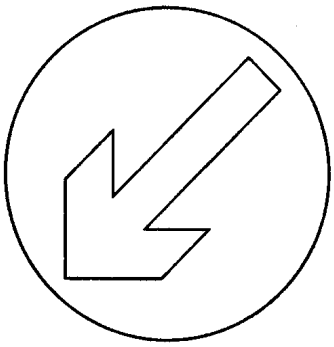

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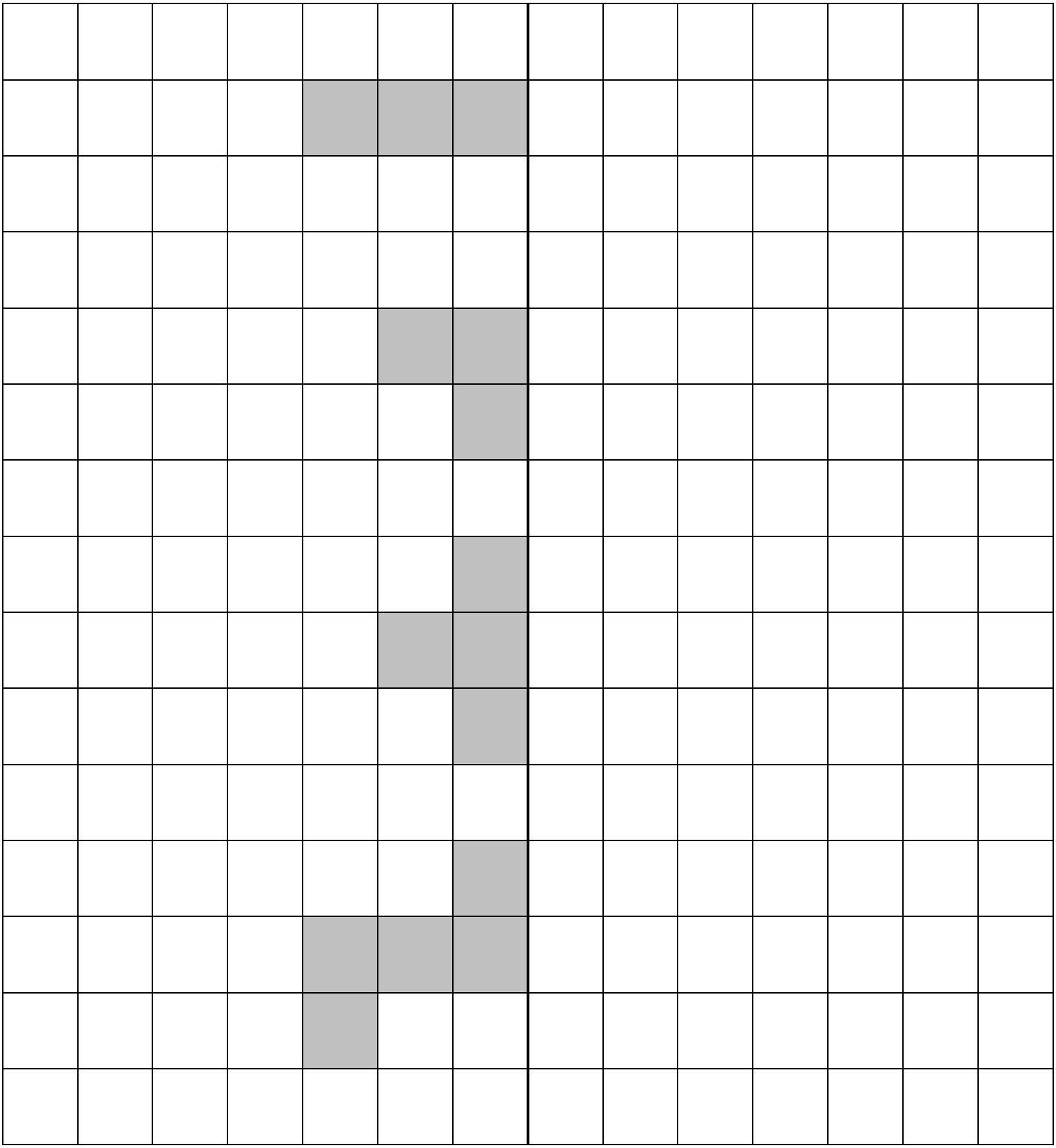

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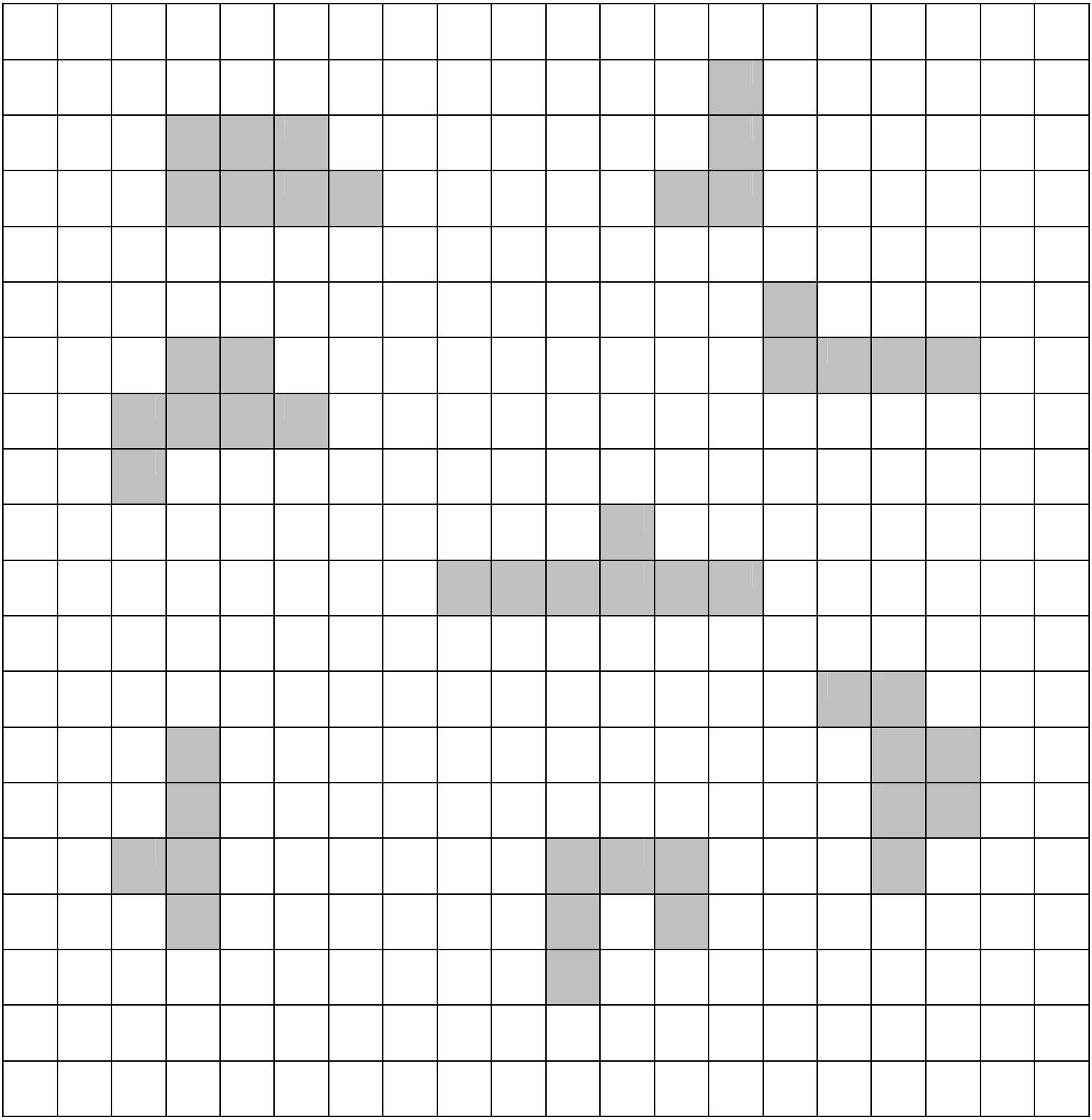

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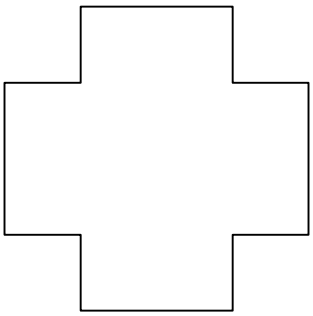

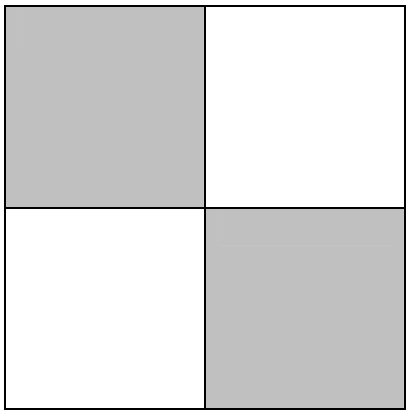

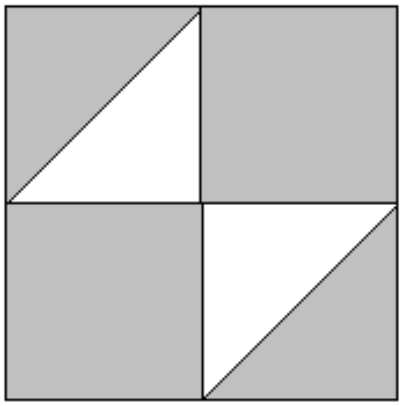

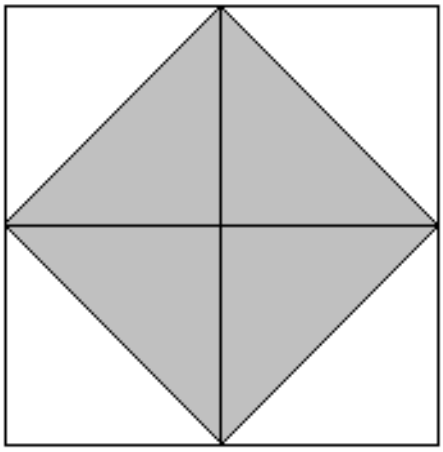

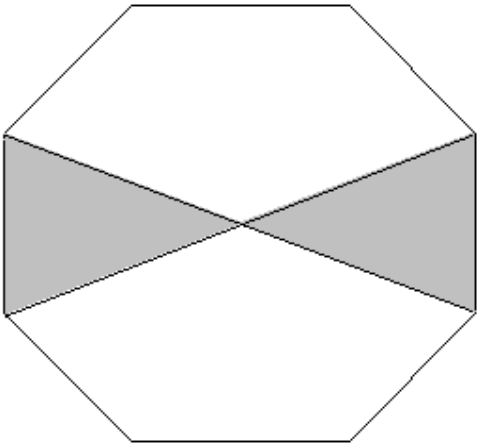

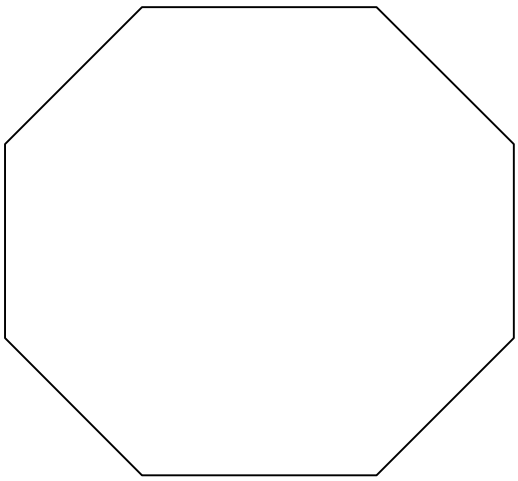

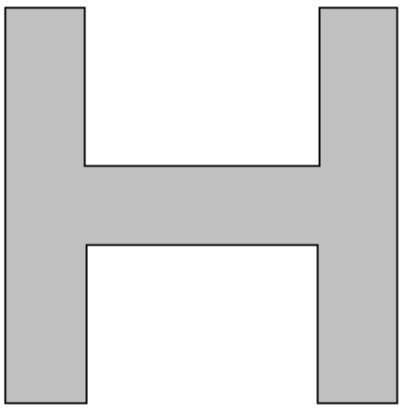

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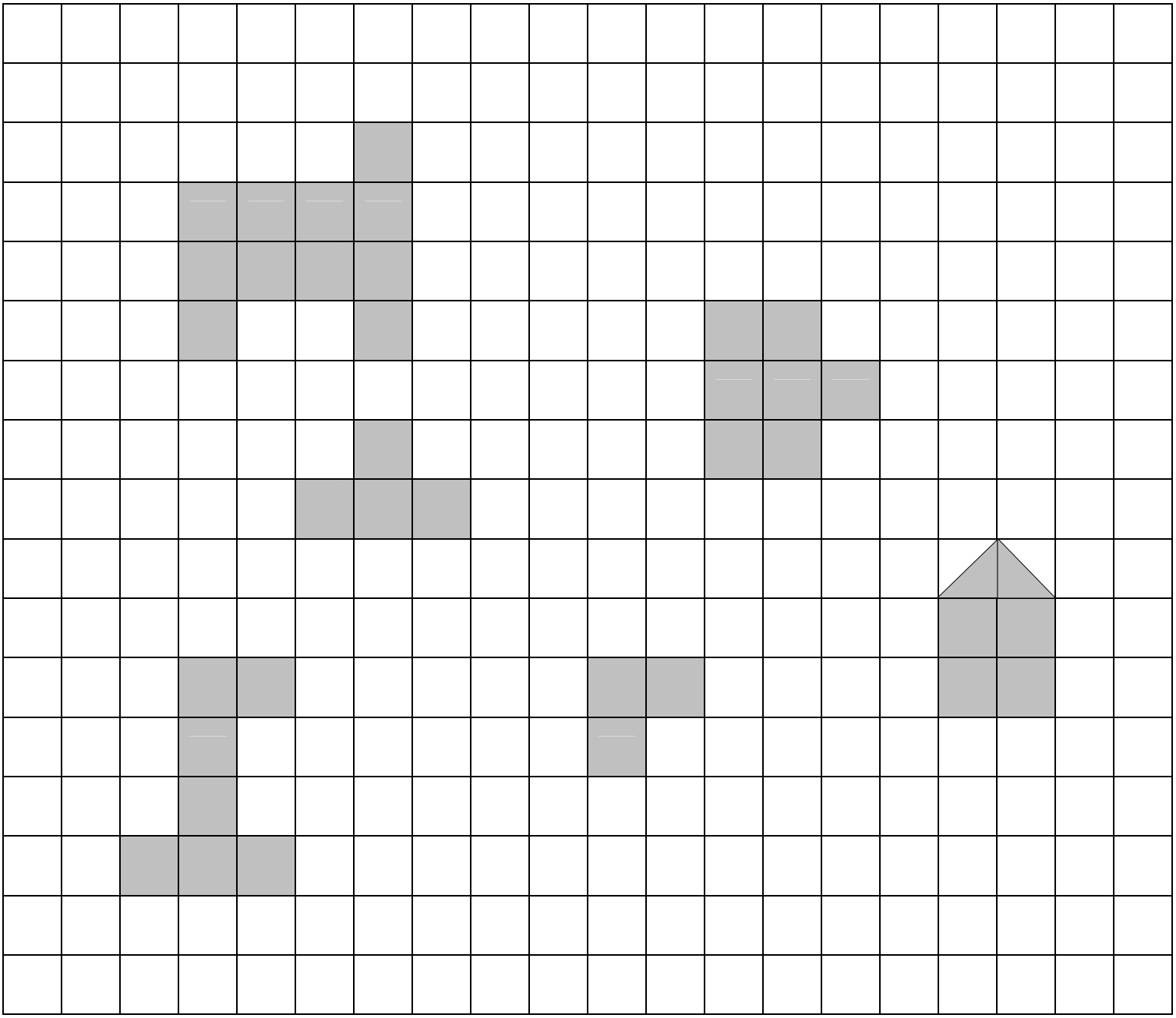

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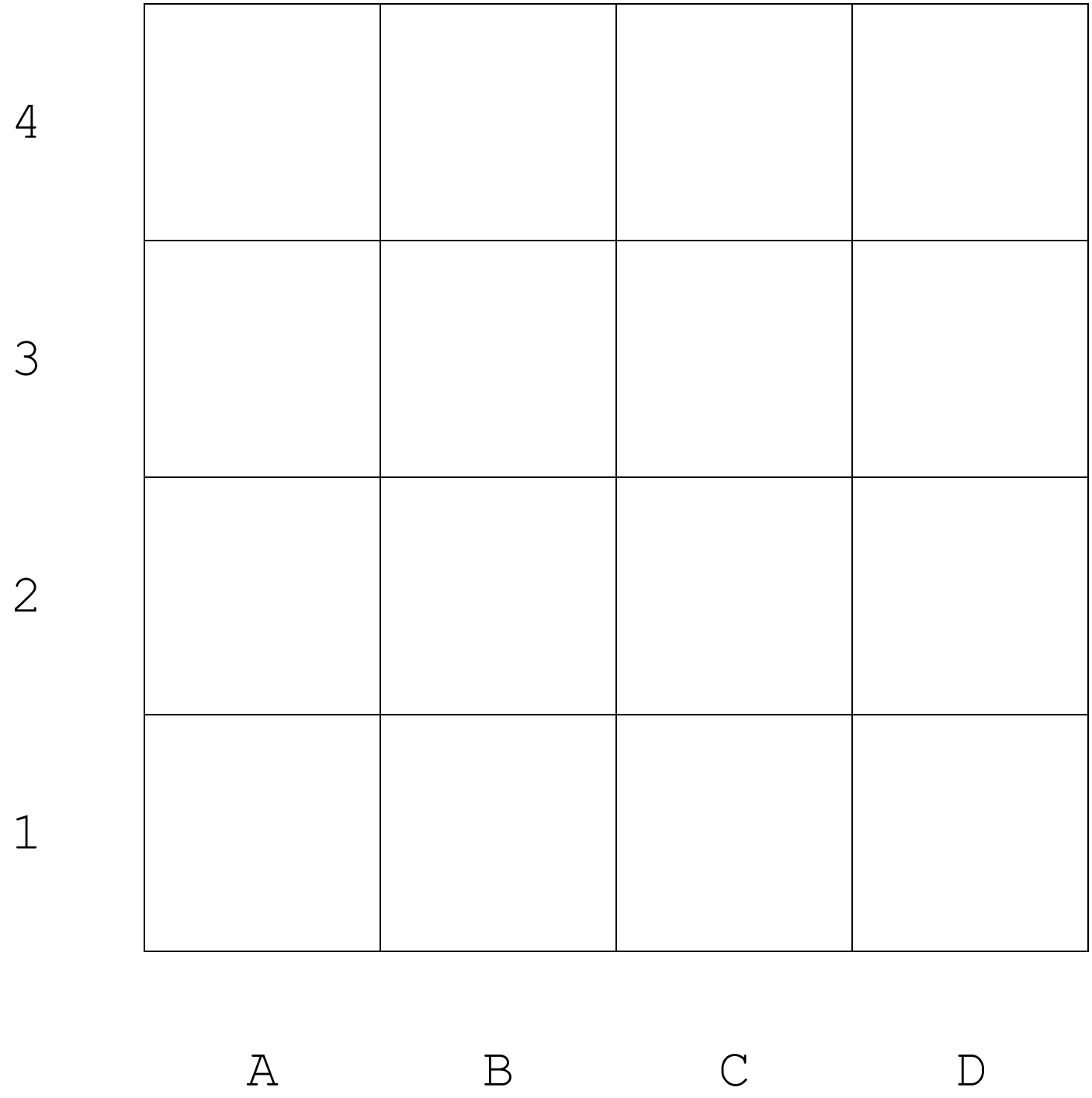

RESOURCE SHEET

LINES OF SYMMETRY