

CLASS 5 · MATHS · CHAPTER 10

Symmetrical Designs

LEARN the ideas step by step, then CHECK with every question and activity from the textbook chapter

14

Learn slides

24

Exercise questions

5Fold, turn, spot, design,
make

Ready-to-teach smartboard lessons, one click at a time.

How this deck runs

1

Learn

Click to reveal each idea.
Pause and ask the question in the notes before you click.

2

Try it

Quick sorts and "which type?" slides: let the class call out answers before each click.

3

Check

Every textbook question and activity. Students answer first, then click to reveal.

4

Discuss

Notes give a discussion question, a common mistake and words to listen for.

Let children explain their thinking in their own words.

LEARN

Symmetrical Designs

lines of symmetry · cutouts · firki · turns · digits · block printing

Alphabet cutouts for a birthday

Prem and Manu make letters for Lali.

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Alphabet cutouts for a birthday

Prem and Manu make letters for Lali.

The plan

They paste "Happy Birthday" cutouts on a wall for Lali.

Alphabet cutouts for a birthday

Prem and Manu make letters for Lali.

The plan

They paste "Happy Birthday" cutouts on a wall for Lali.

The idea

Some letters are easy to cut because of lines of symmetry.

Alphabet cutouts for a birthday

Prem and Manu make letters for Lali.

The plan

They paste "Happy Birthday" cutouts on a wall for Lali.

The idea

Some letters are easy to cut because of lines of symmetry.

Grade 4 link

They use reflection symmetry from Grade 4.

Cutting the letter A

A has one vertical line of symmetry.

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Cutting the letter A

A has one vertical line of symmetry.

1

1. Fold

Fold a paper in half

Cutting the letter A

A has one vertical line of symmetry.

1

1. Fold

Fold a paper in half



2

2. Draw

Draw half of the letter A
along the fold

Cutting the letter A

A has one vertical line of symmetry.

1

1. Fold

Fold a paper in half

2

2. Draw

Draw half of the letter A
along the fold

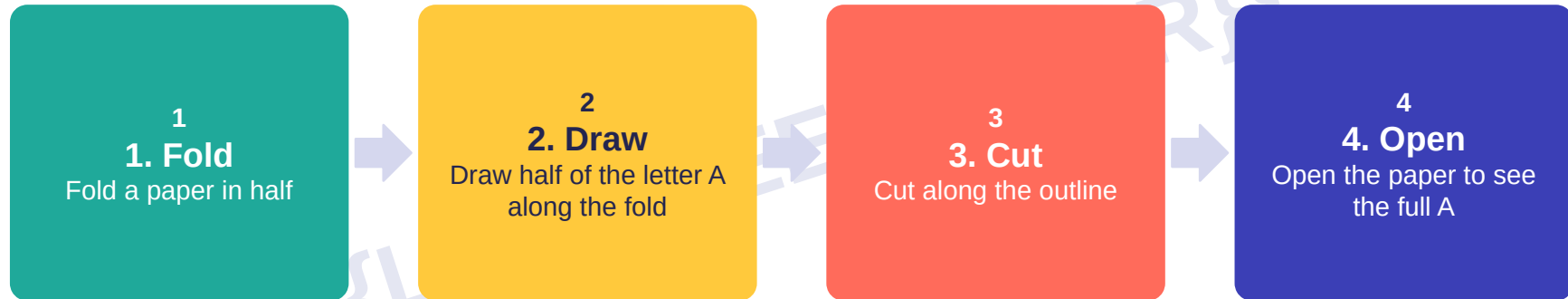
3

3. Cut

Cut along the outline

Cutting the letter A

A has one vertical line of symmetry.



Letter A and letter H

Letter

How to cut it

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Letter A and letter H

Letter

A: one line of symmetry

How to cut it

Fold in half; draw half of A on the fold

Letter A and letter H

Letter

A: one line of symmetry

H: two lines of symmetry

How to cut it

Fold in half; draw half of A on the fold

Fold in one-fourth: once up-down, once across

Letter A and letter H

Letter

A: one line of symmetry

H: two lines of symmetry

H: draw

How to cut it

Fold in half; draw half of A on the fold

Fold in one-fourth: once up-down, once across

Draw one-fourth of H along the folds

Letter A and letter H

Letter

A: one line of symmetry

H: two lines of symmetry

H: draw

H: result

How to cut it

Fold in half; draw half of A on the fold

Fold in one-fourth: once up-down, once across

Draw one-fourth of H along the folds

Cut, open, and the full H appears

Make a windmill firki

Lali makes firkis for her friends.

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Make a windmill firki

Lali makes firkis for her friends.

1

Fold

Fold a square paper diagonally both ways to get an X

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Make a windmill firki

Lali makes firkis for her friends.

1

Fold

Fold a square paper diagonally both ways to get an X



2

Cut

Cut along the four lines of the X, stopping halfway to the centre

Make a windmill firki

Lali makes firkis for her friends.

1

Fold

Fold a square paper diagonally both ways to get an X

2

Cut

Cut along the four lines of the X, stopping halfway to the centre

3

Bend

Fold every other corner gently to the centre; do not press flat

Make a windmill firki

Lali makes firkis for her friends.

1

Fold

Fold a square paper diagonally both ways to get an X

2

Cut

Cut along the four lines of the X, stopping halfway to the centre

3

Bend

Fold every other corner gently to the centre; do not press flat

4

Pin

Push a pin through the corners and the centre

Make a windmill firki

Lali makes firkis for her friends.



Turning the firki

Watch the dot as the firki turns.

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Turning the firki

Watch the dot as the firki turns.

1/4 turn

The dot moves to a new place, but the firki looks the same.

Turning the firki

Watch the dot as the firki turns.

$\frac{1}{4}$ turn

The dot moves to a new place, but the firki looks the same.

$\frac{1}{2}$ turn

The firki looks the same again.

Turning the firki

Watch the dot as the firki turns.

1/4 turn

The dot moves to a new place, but the firki looks the same.

1/2 turn

The firki looks the same again.

3/4 turn

Still looks the same.

Turning the firki

Watch the dot as the firki turns.

1/4 turn

The dot moves to a new place, but the firki looks the same.

1/2 turn

The firki looks the same again.

3/4 turn

Still looks the same.

Full turn

Back to where it began.

What is rotational symmetry?

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What is rotational symmetry?

1

A shape has rotational symmetry if it looks the same after turning it less than a full turn.

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What is rotational symmetry?

- 1 A shape has rotational symmetry if it looks the same after turning it less than a full turn.
- 2 H looks the same after a half turn. So H has rotational symmetry.

What is rotational symmetry?

- 1 A shape has rotational symmetry if it looks the same after turning it less than a full turn.
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What is rotational symmetry?

- 1 A shape has rotational symmetry if it looks the same after turning it less than a full turn.
- 2 H looks the same after a half turn. So H has rotational symmetry.
- 3 A firki looks the same after $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ turn.
- 4 Use a dot, a nail at the centre, or tracing paper to check.

Letters when turned

Letter

 $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$

Rotational?

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Letters when turned

Letter	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	Rotational?
H	Different	Same	Different	Yes, at $\frac{1}{2}$

Letters when turned

Letter	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	Rotational?
H	Different	Same	Different	Yes, at $\frac{1}{2}$
I	Different	Same	Different	Yes, at $\frac{1}{2}$

Letters when turned

Letter	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	Rotational?
H	Different	Same	Different	Yes, at $\frac{1}{2}$
I	Different	Same	Different	Yes, at $\frac{1}{2}$
X	Same	Same	Same	Yes, at $\frac{1}{4}$

Letters when turned

Letter	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	Rotational?
H	Different	Same	Different	Yes, at $\frac{1}{2}$
I	Different	Same	Different	Yes, at $\frac{1}{2}$
X	Same	Same	Same	Yes, at $\frac{1}{4}$
Y	Different	Different	Different	No

Symmetry in digits

Digit

Reflection

Rotation

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Symmetry in digits

Digit	Reflection	Rotation
1	Yes	Yes (1/2 turn)

Symmetry in digits

Digit	Reflection	Rotation
1	Yes	Yes (1/2 turn)
0	Yes	Yes (1/2 turn)

Symmetry in digits

Digit	Reflection	Rotation
1	Yes	Yes (1/2 turn)
0	Yes	Yes (1/2 turn)
8	Yes	Yes (1/2 turn)

Symmetry in digits

Digit	Reflection	Rotation
1	Yes	Yes (1/2 turn)
0	Yes	Yes (1/2 turn)
8	Yes	Yes (1/2 turn)
3	Yes (across)	No

Symmetry in digits

Digit	Reflection	Rotation
1	Yes	Yes (1/2 turn)
0	Yes	Yes (1/2 turn)
8	Yes	Yes (1/2 turn)
3	Yes (across)	No
2, 4, 5, 7	No	No

Symmetry in digits

Digit	Reflection	Rotation
1	Yes	Yes (1/2 turn)
0	Yes	Yes (1/2 turn)
8	Yes	Yes (1/2 turn)
3	Yes (across)	No
2, 4, 5, 7	No	No
6 and 9	No	Turn into each other

Making a design turn-proof

Add shapes so a design looks the same after turns.

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Making a design turn-proof

Add shapes so a design looks the same after turns.

1

Start

The book design has a circle, four triangles and one extra circle on the right

Making a design turn-proof

Add shapes so a design looks the same after turns.

1

Start

The book design has a circle, four triangles and one extra circle on the right



2

Look

It has no rotational symmetry as it is

Making a design turn-proof

Add shapes so a design looks the same after turns.

1

Start

The book design has a circle, four triangles and one extra circle on the right



2

Look

It has no rotational symmetry as it is



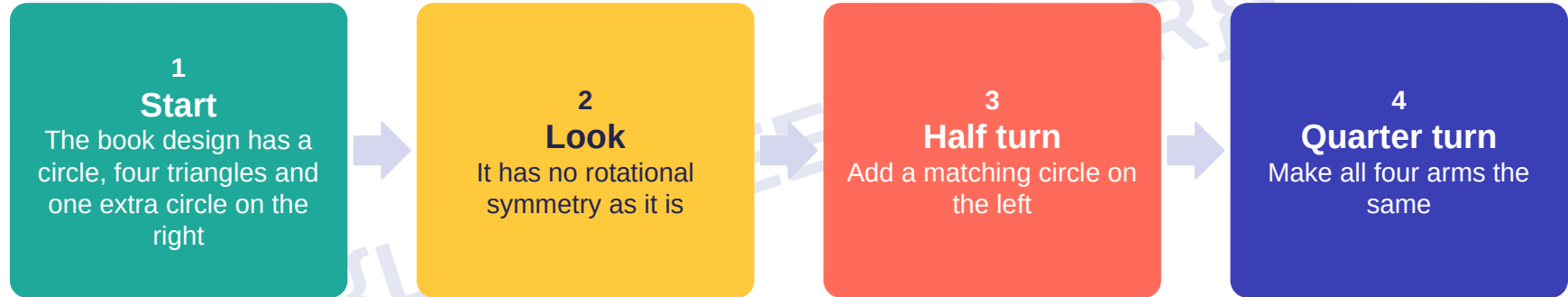
3

Half turn

Add a matching circle on the left

Making a design turn-proof

Add shapes so a design looks the same after turns.



Two kinds of symmetry

Kind

What you do

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Two kinds of symmetry

Kind

Reflection symmetry

What you do

Fold along a line; both halves match

Two kinds of symmetry

Kind

Reflection symmetry

Rotational symmetry

What you do

Fold along a line; both halves match

Turn it; it looks the same before a full turn

Two kinds of symmetry

Kind

Reflection symmetry

Rotational symmetry

Both

What you do

Fold along a line; both halves match

Turn it; it looks the same before a full turn

Some shapes, like X, have both

Two kinds of symmetry

Kind

Reflection symmetry

Rotational symmetry

Both

Only one

What you do

Fold along a line; both halves match

Turn it; it looks the same before a full turn

Some shapes, like X, have both

N: rotation only. T: reflection only

Block printing from Rajasthan

A traditional craft with bright colours.

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Block printing from Rajasthan

A traditional craft with bright colours.

The craft

Artisans carve wooden blocks and print designs on fabric.

Block printing from Rajasthan

A traditional craft with bright colours.

The craft

Artisans carve wooden blocks and print designs on fabric.

Old art

It has been practised for centuries.

Block printing from Rajasthan

A traditional craft with bright colours.

The craft

Artisans carve wooden blocks and print designs on fabric.

Old art

It has been practised for centuries.

Special textiles

It makes the textiles of Rajasthan special.

One block, four prints

A leaf block makes a design A.

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One block, four prints

A leaf block makes a design A.

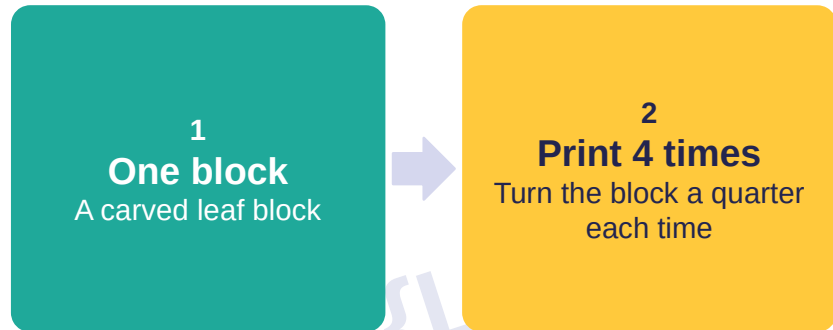
1

One block

A carved leaf block

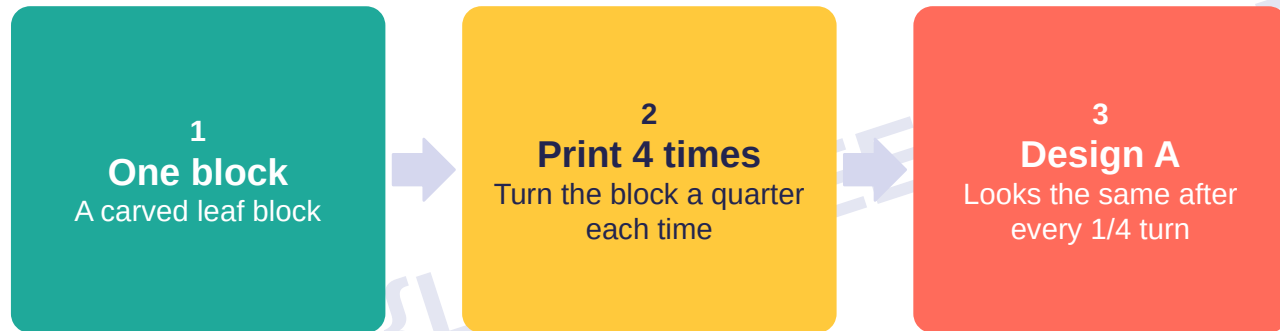
One block, four prints

A leaf block makes a design A.



One block, four prints

A leaf block makes a design A.



One block, four prints

A leaf block makes a design A.



Vegetable block printing

Project: make patterns with vegetables.

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Vegetable block printing

Project: make patterns with vegetables.

Okra

Cut an okra to print a flower-like pattern.

Vegetable block printing

Project: make patterns with vegetables.

Okra

Cut an okra to print a flower-like pattern.

Potato

A cut potato block prints a stamp pattern.

Vegetable block printing

Project: make patterns with vegetables.

Okra

Cut an okra to print a flower-like pattern.

Potato

A cut potato block prints a stamp pattern.

Your design

Make symmetrical patterns and designs.

Points to remember

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Points to remember

- 1 Reflection symmetry: a shape matches itself when folded along a line.

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Points to remember

- 1 Reflection symmetry: a shape matches itself when folded along a line.
- 2 Rotational symmetry: a shape looks the same after a turn smaller than a full turn.

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- 1 Reflection symmetry: a shape matches itself when folded along a line.
- 2 Rotational symmetry: a shape looks the same after a turn smaller than a full turn.
- 3 Some shapes have both, like X, 8, 0 and a square.

Points to remember

- 1 Reflection symmetry: a shape matches itself when folded along a line.
- 2 Rotational symmetry: a shape looks the same after a turn smaller than a full turn.
- 3 Some shapes have both, like X, 8, 0 and a square.
- 4 Artisans use blocks to print symmetrical designs.

CHECK

Every task from the chapter

Every task from the textbook chapter, in book order, with a worked answer. Make and draw tasks show what a good result includes.

Which of E N X T K V O can be cut by drawing just half or one-fourth of the letter?

30s

Think and write your answer first. Then share with your partner.

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Which of E N X T K V O can be cut by drawing just half or one-fourth of the letter?

30s

Think and write your answer first. Then share with your partner.

Model answer

E, X, T, K, V and O. E, T, K, V need half; X and O need one-fourth. N has no line of symmetry, so it cannot.

Which of E N X T K V O can be cut by drawing just half or one-fourth of the letter?

30s

Think and write your answer first. Then share with your partner.

Model answer

E, X, T, K, V and O. E, T, K, V need half; X and O need one-fourth. N has no line of symmetry, so it cannot.

Listen for:

all but N

X and O: $\frac{1}{4}$

Lines of symmetry in E N X T K V O

Question	Letters
Horizontal line	
Vertical line	
Both lines	

Lines of symmetry in E N X T K V O

Question

Horizontal line

Vertical line

Both lines

Letters

E, X, K, O

Lines of symmetry in E N X T K V O

Question	Letters
Horizontal line	E, X, K, O
Vertical line	X, T, V, O
Both lines	

Lines of symmetry in E N X T K V O

Question	Letters
Horizontal line	E, X, K, O
Vertical line	X, T, V, O
Both lines	X, O

Use lines of symmetry to make paper cutouts of a diya, a boat and other designs from the page border.

30s

Think and write your answer first. Then share with your partner.

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Use lines of symmetry to make paper cutouts of a diya, a boat and other designs from the page border.

30s

Think and write your answer first. Then share with your partner.

Model answer

Answers vary. A good cutout: fold the paper on the line of symmetry, draw half the shape on the fold, cut, open. It should match on both sides.

Use lines of symmetry to make paper cutouts of a diya, a boat and other designs from the page border.

30s

Think and write your answer first. Then share with your partner.

Model answer

Answers vary. A good cutout: fold the paper on the line of symmetry, draw half the shape on the fold, cut, open. It should match on both sides.

Listen for:**fold first****half drawn****matches**

Make your own windmill firki using the nine steps. Does it spin in the wind?

30s

Think and write your answer first. Then share with your partner.

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Make your own windmill firki using the nine steps. Does it spin in the wind?

30s

Think and write your answer first. Then share with your partner.

Model answer

Answers vary. A good firki: square paper, X cuts to halfway, alternate corners bent to the centre, pin loose enough to spin, fixed on a stick.

Make your own windmill firki using the nine steps. Does it spin in the wind?

30s

Think and write your answer first. Then share with your partner.

Model answer

Answers vary. A good firki: square paper, X cuts to halfway, alternate corners bent to the centre, pin loose enough to spin, fixed on a stick.

Listen for:

pin not tight

it spins

Observe the dot in the firki. Does it look the same after $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and a full turn?

30s

Think and write your answer first. Then share with your partner.

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Observe the dot in the firki. Does it look the same after $1/4$, $1/2$, $3/4$ and a full turn?

30s

Think and write your answer first. Then share with your partner.

Model answer

Yes. The dot moves to a new place, but the firki looks the same after $1/4$, $1/2$ and $3/4$ turn, and after a full turn.

Observe the dot in the firki. Does it look the same after $1/4$, $1/2$, $3/4$ and a full turn?

30s

Think and write your answer first. Then share with your partner.

Model answer

Yes. The dot moves to a new place, but the firki looks the same after $1/4$, $1/2$ and $3/4$ turn, and after a full turn.

Listen for:

yes, all turns

dot moves

Does it look the same after each turn?

Letter	Rotational symmetry?
I: $1/4$ and $3/4$ differ; $1/2$ same	
X: same at $1/4$, $1/2$, $3/4$	
Y: differs at $1/4$, $1/2$, $3/4$	

Does it look the same after each turn?

Letter

I: $1/4$ and $3/4$ differ; $1/2$ same

X: same at $1/4$, $1/2$, $3/4$

Y: differs at $1/4$, $1/2$, $3/4$

Rotational symmetry?

Yes, at $1/2$ turn

Does it look the same after each turn?

Letter

I: $1/4$ and $3/4$ differ; $1/2$ same

X: same at $1/4$, $1/2$, $3/4$

Y: differs at $1/4$, $1/2$, $3/4$

Rotational symmetry?

Yes, at $1/2$ turn

Yes, at $1/4$ turn

Does it look the same after each turn?

Letter

I: $1/4$ and $3/4$ differ; $1/2$ same

X: same at $1/4$, $1/2$, $3/4$

Y: differs at $1/4$, $1/2$, $3/4$

Rotational symmetry?

Yes, at $1/2$ turn

Yes, at $1/4$ turn

No

Which digits (1 2 3 4 5 6 7 8 9 0) have reflection symmetry?

30s

Think and write your answer first. Then share with your partner.

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Which digits (1 2 3 4 5 6 7 8 9 0) have reflection symmetry?

30s

Think and write your answer first. Then share with your partner.

Model answer

1, 3, 8 and 0. (1, 8 and 0 have two lines; 3 has a horizontal line.)

Which digits (1 2 3 4 5 6 7 8 9 0) have reflection symmetry?

30s

Think and write your answer first. Then share with your partner.

Model answer

1, 3, 8 and 0. (1, 8 and 0 have two lines; 3 has a horizontal line.)

Listen for:

1, 3, 8, 0

Which digits have rotational symmetry? Which have both rotational and reflection symmetry?

30s

Think and write your answer first. Then share with your partner.

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Which digits have rotational symmetry? Which have both rotational and reflection symmetry?

30s

Think and write your answer first. Then share with your partner.

Model answer

Rotational: 1, 8 and 0 (half turn). Both: 1, 8 and 0, because they also have reflection symmetry.

Which digits have rotational symmetry? Which have both rotational and reflection symmetry?

30s

Think and write your answer first. Then share with your partner.

Model answer

Rotational: 1, 8 and 0 (half turn). Both: 1, 8 and 0, because they also have reflection symmetry.

Listen for:

1, 8, 0

both: same three

Do the numbers 11 and 1001 have (a) rotational symmetry, (b) reflection symmetry, or (c) both?

30s

Think and write your answer first. Then share with your partner.

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Do the numbers 11 and 1001 have (a) rotational symmetry, (b) reflection symmetry, or (c) both?

30s

Think and write your answer first. Then share with your partner.

Model answer

Both. Each looks the same after a half turn, and each has a vertical line of symmetry in the middle.

Do the numbers 11 and 1001 have (a) rotational symmetry, (b) reflection symmetry, or (c) both?

30s

Think and write your answer first. Then share with your partner.

Model answer

Both. Each looks the same after a half turn, and each has a vertical line of symmetry in the middle.

Listen for:

both**half turn****vertical line**

Give 2-, 3- and 4-digit numbers with rotational symmetry, reflection symmetry, or both.

30s

Think and write your answer first. Then share with your partner.

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Give 2-, 3- and 4-digit numbers with rotational symmetry, reflection symmetry, or both.

30s

Think and write your answer first. Then share with your partner.

Model answer

Both: 11, 808, 1001. Rotation only: 69, 609, 6009. Reflection only: 13, 313, 3113.
Answers vary.

Give 2-, 3- and 4-digit numbers with rotational symmetry, reflection symmetry, or both.

30s

Think and write your answer first. Then share with your partner.

Model answer

Both: 11, 808, 1001. Rotation only: 69, 609, 6009. Reflection only: 13, 313, 3113.
Answers vary.

Listen for:

both: 11, 808

rotation: 69

Does the design (a circle with four triangles and one extra circle on the right) have rotational symmetry?

30s

Think and write your answer first. Then share with your partner.

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Does the design (a circle with four triangles and one extra circle on the right) have rotational symmetry?

30s

Think and write your answer first. Then share with your partner.

Model answer

No. The extra circle on the right has no match on the left, and the triangles are not all alike, so it does not look the same after a turn.

Does the design (a circle with four triangles and one extra circle on the right) have rotational symmetry?

30s

Think and write your answer first. Then share with your partner.

Model answer

No. The extra circle on the right has no match on the left, and the triangles are not all alike, so it does not look the same after a turn.

Listen for:

no

extra circle

Add shapes so the design looks the same after a $\frac{1}{2}$ turn; then after a $\frac{1}{4}$ turn. Draw them in your notebook.

30s

Think and write your answer first. Then share with your partner.

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Add shapes so the design looks the same after a $1/2$ turn; then after a $1/4$ turn. Draw them in your notebook.

30s

Think and write your answer first. Then share with your partner.

Model answer

Answers vary. (b) Add a circle on the left end. (c) Make all four arms alike (triangle plus end circle), adding circles at the top and bottom.

Add shapes so the design looks the same after a $1/2$ turn; then after a $1/4$ turn. Draw them in your notebook.

30s

Think and write your answer first. Then share with your partner.

Model answer

Answers vary. (b) Add a circle on the left end. (c) Make all four arms alike (triangle plus end circle), adding circles at the top and bottom.

Listen for:

circle on left

four equal arms

Do the new designs have reflection symmetry? If yes, draw the lines of symmetry.

30s

Think and write your answer first. Then share with your partner.

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Do the new designs have reflection symmetry? If yes, draw the lines of symmetry.

30s

Think and write your answer first. Then share with your partner.

Model answer

Yes. The $\frac{1}{2}$ -turn design has 2 lines (vertical and horizontal). The $\frac{1}{4}$ -turn design has 4 lines (vertical, horizontal and two diagonals).

Do the new designs have reflection symmetry? If yes, draw the lines of symmetry.

30s

Think and write your answer first. Then share with your partner.

Model answer

Yes. The $1/2$ -turn design has 2 lines (vertical and horizontal). The $1/4$ -turn design has 4 lines (vertical, horizontal and two diagonals).

Listen for:

yes

2 lines

4 lines

A 2 by 2 square has two green and two pink squares along diagonals. Does it look the same after $1/2$ turn? After $1/4$ turn?

30s

Think and write your answer first. Then share with your partner.

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A 2 by 2 square has two green and two pink squares along diagonals. Does it look the same after $1/2$ turn? After $1/4$ turn?

30s

Think and write your answer first. Then share with your partner.

Model answer

After $1/2$ turn: yes. After $1/4$ turn: no, as green and pink would swap places.

A 2 by 2 square has two green and two pink squares along diagonals. Does it look the same after $1/2$ turn? After $1/4$ turn?

30s

Think and write your answer first. Then share with your partner.

Model answer

After $1/2$ turn: yes. After $1/4$ turn: no, as green and pink would swap places.

Listen for: **$1/2$: yes** **$1/4$: no**

Colour the square (cut by dashed lines into 8 triangles) with two colours so it looks the same after every $\frac{1}{4}$ turn. How many times does it look the same in a full turn?

30s

Think and write your answer first. Then share with your partner.

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Colour the square (cut by dashed lines into 8 triangles) with two colours so it looks the same after every $\frac{1}{4}$ turn. How many times does it look the same in a full turn?

30s

Think and write your answer first. Then share with your partner.

Model answer

Colour alternate triangles with two colours. It looks the same 4 times in a full turn (after $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and the full turn).

Colour the square (cut by dashed lines into 8 triangles) with two colours so it looks the same after every $\frac{1}{4}$ turn. How many times does it look the same in a full turn?

30s

Think and write your answer first. Then share with your partner.

Model answer

Colour alternate triangles with two colours. It looks the same 4 times in a full turn (after $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and the full turn).

Listen for:

alternate triangles

4 times

Do these designs have reflection symmetry also? Draw the line(s) of symmetry.

30s

Think and write your answer first. Then share with your partner.

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Do these designs have reflection symmetry also? Draw the line(s) of symmetry.

30s

Think and write your answer first. Then share with your partner.

Model answer

The 2 by 2 design: yes, along the two diagonals through the same-coloured squares. The alternate-triangle square: no, as each dashed line swaps the colours.

Do these designs have reflection symmetry also? Draw the line(s) of symmetry.

30s

Think and write your answer first. Then share with your partner.

Model answer

The 2 by 2 design: yes, along the two diagonals through the same-coloured squares. The alternate-triangle square: no, as each dashed line swaps the colours.

Listen for:**2x2: 2 diagonals****triangles: no**

**Cut out squares and equilateral triangles of the same side.
Make different symmetrical designs with them.**

30s

Think and write your answer first. Then share with your partner.

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**Cut out squares and equilateral triangles of the same side.
Make different symmetrical designs with them.**

30s

Think and write your answer first. Then share with your partner.

Model answer

Answers vary. A good design uses only these two shapes, is symmetric, and has its fold lines or turns checked.

**Cut out squares and equilateral triangles of the same side.
Make different symmetrical designs with them.**

30s

Think and write your answer first. Then share with your partner.

Model answer

Answers vary. A good design uses only these two shapes, is symmetric, and has its fold lines or turns checked.

Listen for:**two shapes****symmetrical**

The shape has 4 squares (2 by 2) with a triangle on the left and right end of each row (4 triangles). Reflection lines? Rotational symmetry, at which turn? Both?

30s

Think and write your answer first. Then share with your partner.

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The shape has 4 squares (2 by 2) with a triangle on the left and right end of each row (4 triangles). Reflection lines? Rotational symmetry, at which turn? Both?

Think and write your answer first. Then share with your partner.

Model answer

Yes: 2 lines (vertical and horizontal). Rotation: yes, at $1/2$ turn only. So it has both symmetries.

The shape has 4 squares (2 by 2) with a triangle on the left and right end of each row (4 triangles). Reflection lines? Rotational symmetry, at which turn? Both?

30s

Think and write your answer first. Then share with your partner.

Model answer

Yes: 2 lines (vertical and horizontal). Rotation: yes, at $1/2$ turn only. So it has both symmetries.

Listen for:

2 lines

 $1/2$ turn

both

Sort your designs into: only rotational, only reflection, both.

30s

Think and write your answer first. Then share with your partner.

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Sort your designs into: only rotational, only reflection, both.

30s

Think and write your answer first. Then share with your partner.

Model answer

Answers vary. A good sort has 3 groups with each design checked by folding and by turning (tracing paper or a nail at the centre).

Sort your designs into: only rotational, only reflection, both.

30s

Think and write your answer first. Then share with your partner.

Model answer

Answers vary. A good sort has 3 groups with each design checked by folding and by turning (tracing paper or a nail at the centre).

Listen for:

3 groups

check by fold

check by turn

Match each block to its print (iv-e is given)

Block	Print
(i) paisley	
(ii) lotus	
(iii) round flower	
(iv) fan	
(v) flowering stem	

Match each block to its print (iv-e is given)

Block	Print
(i) paisley	(c)
(ii) lotus	
(iii) round flower	
(iv) fan	
(v) flowering stem	

Match each block to its print (iv-e is given)

Block	Print
(i) paisley	(c)
(ii) lotus	(d)
(iii) round flower	
(iv) fan	
(v) flowering stem	

Match each block to its print (iv-e is given)

Block	Print
(i) paisley	(c)
(ii) lotus	(d)
(iii) round flower	(a)
(iv) fan	
(v) flowering stem	

Match each block to its print (iv-e is given)

Block	Print
(i) paisley	(c)
(ii) lotus	(d)
(iii) round flower	(a)
(iv) fan	(e)
(v) flowering stem	

Match each block to its print (iv-e is given)

Block	Print
(i) paisley	(c)
(ii) lotus	(d)
(iii) round flower	(a)
(iv) fan	(e)
(v) flowering stem	(b)

1 Design B looks the same after every ____ turn.

2 This design has ____ symmetry (and reflection too).

1 Design B looks the same after every ____ turn.

1/4

2 This design has ____ symmetry (and reflection too).

1 Design B looks the same after every ____ turn.

1/4

2 This design has ____ symmetry (and reflection too).

rotational

Shapes on the border: reflection (check) or rotation (*)

Shape	Check / *
Six-pointed star, hexagon	
Three circles joined, Y-shape	
Square, circle, rectangle	
Green hexagon with 3 grey triangles	
Rhombus (tilted)	
Three pink triangles in a pinwheel	

Shapes on the border: reflection (check) or rotation (*)

Shape	Check / *
Six-pointed star, hexagon	Both
Three circles joined, Y-shape	
Square, circle, rectangle	
Green hexagon with 3 grey triangles	
Rhombus (tilted)	
Three pink triangles in a pinwheel	

Shapes on the border: reflection (check) or rotation (*)

Shape	Check / *
Six-pointed star, hexagon	Both
Three circles joined, Y-shape	Both
Square, circle, rectangle	
Green hexagon with 3 grey triangles	
Rhombus (tilted)	
Three pink triangles in a pinwheel	

Shapes on the border: reflection (check) or rotation (*)

Shape	Check / *
Six-pointed star, hexagon	Both
Three circles joined, Y-shape	Both
Square, circle, rectangle	Both
Green hexagon with 3 grey triangles	
Rhombus (tilted)	
Three pink triangles in a pinwheel	

Shapes on the border: reflection (check) or rotation (*)

Shape	Check / *
Six-pointed star, hexagon	Both
Three circles joined, Y-shape	Both
Square, circle, rectangle	Both
Green hexagon with 3 grey triangles	Both
Rhombus (tilted)	
Three pink triangles in a pinwheel	

Shapes on the border: reflection (check) or rotation (*)

Shape	Check / *
Six-pointed star, hexagon	Both
Three circles joined, Y-shape	Both
Square, circle, rectangle	Both
Green hexagon with 3 grey triangles	Both
Rhombus (tilted)	Both
Three pink triangles in a pinwheel	

Shapes on the border: reflection (check) or rotation (*)

Shape	Check / *
Six-pointed star, hexagon	Both
Three circles joined, Y-shape	Both
Square, circle, rectangle	Both
Green hexagon with 3 grey triangles	Both
Rhombus (tilted)	Both
Three pink triangles in a pinwheel	* only

More border shapes

Shape	Check / *
Pentagon, heptagon (regular)	
Triangle with circles at corners	
Blue four-triangle shape	
Peach parallelogram	
Maroon bow-tie, pink tilted triangle	

More border shapes

Shape	Check / *
Pentagon, heptagon (regular)	Both
Triangle with circles at corners	
Blue four-triangle shape	
Peach parallelogram	
Maroon bow-tie, pink tilted triangle	

More border shapes

Shape	Check / *
Pentagon, heptagon (regular)	Both
Triangle with circles at corners	Both
Blue four-triangle shape	
Peach parallelogram	
Maroon bow-tie, pink tilted triangle	

More border shapes

Shape	Check / *
Pentagon, heptagon (regular)	Both
Triangle with circles at corners	Both
Blue four-triangle shape	Both
Peach parallelogram	
Maroon bow-tie, pink tilted triangle	

More border shapes

Shape	Check / *
Pentagon, heptagon (regular)	Both
Triangle with circles at corners	Both
Blue four-triangle shape	Both
Peach parallelogram	* only
Maroon bow-tie, pink tilted triangle	

More border shapes

Shape	Check / *
Pentagon, heptagon (regular)	Both
Triangle with circles at corners	Both
Blue four-triangle shape	Both
Peach parallelogram	* only
Maroon bow-tie, pink tilted triangle	* only / none

Create symmetrical patterns and designs using vegetable blocks.

30s

Think and write your answer first. Then share with your partner.

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Create symmetrical patterns and designs using vegetable blocks.

30s

Think and write your answer first. Then share with your partner.

Model answer

Answers vary. A good print uses a cut vegetable (okra, potato), repeats the block in a turning or mirrored pattern, and shows its lines or turns.

Create symmetrical patterns and designs using vegetable blocks.

30s

Think and write your answer first. Then share with your partner.

Model answer

Answers vary. A good print uses a cut vegetable (okra, potato), repeats the block in a turning or mirrored pattern, and shows its lines or turns.

Listen for:

vegetable block

repeated pattern

Chapter 10 complete

Is the letter X reflection, rotation or both? Say how you know.



Fold



Turn



Spot



Design

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