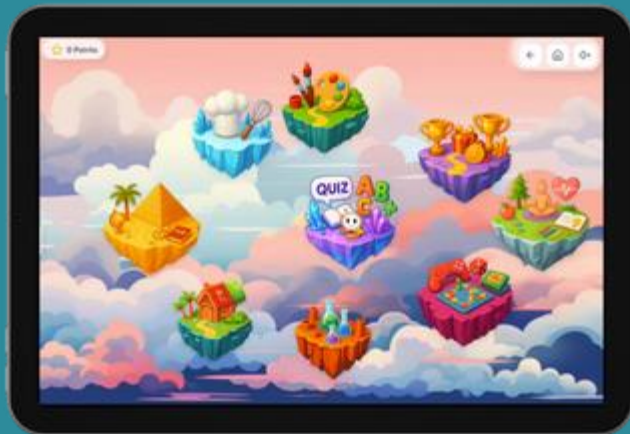


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Creating 2D Shapes - Year 4

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BUILD AND SPLIT 2D SHAPES

1 LOOK AT THE PROPERTIES

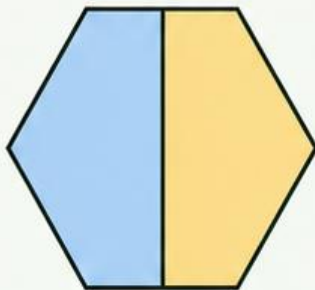
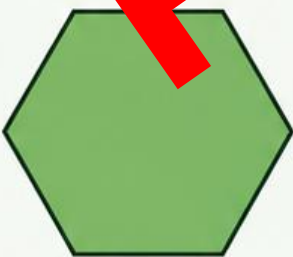
sides • vertices • equal lengths • parallel sides • right angles

2 COMBINE

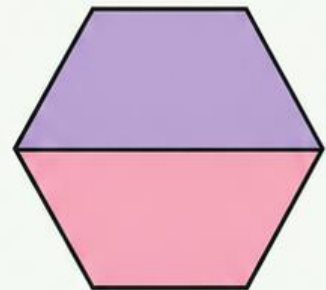


Join edges. No gaps. No overlaps.

3 SPLIT



OR



One shape can be partitioned in more than one way.

4 EXPLAIN

Name the pieces and describe how you know.

COMPOSITE SHAPE CHALLENGE CARDS

Cut out the cards. Build each target with paper shapes. Rotate, flip or slide pieces. Do not overlap them.

A HOUSE

1 square + 1 triangle



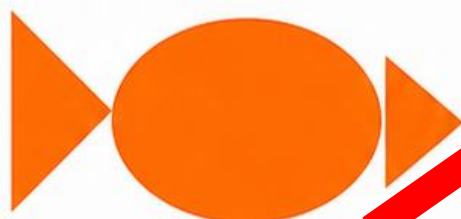
B ROCKET

1 rectangle + 3 triangles



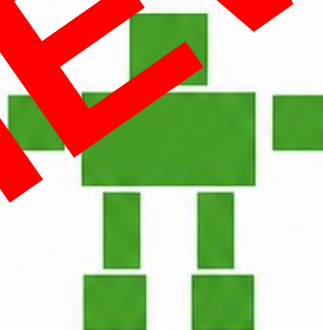
C FISH

2 triangles + 1 oval



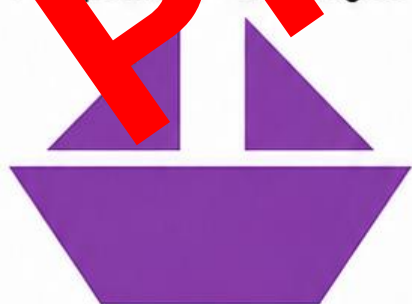
D ROBOT

2 rectangles + 5 squares



E BOAT

1 trapezium + 2 triangles



F CAT

3 triangles + 1 circle



G CASTLE

3 rectangles + 3 triangles



H YOUR DESIGN

Use exactly 7 pieces

COMPOSITE SHAPE DESIGN STUDIO

Use paper shapes to invent a new composite design.

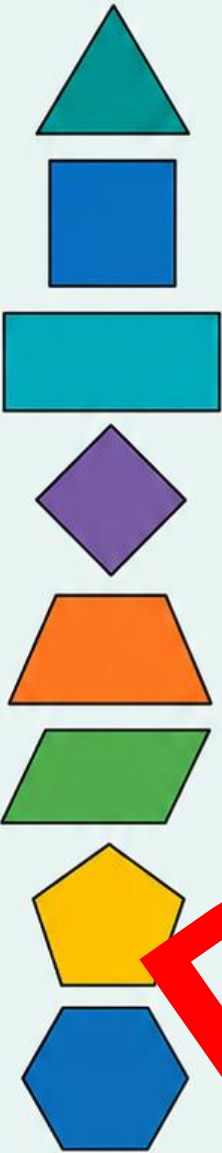
1 PLAN

2 BUILD

3 TRACE

4 EXPLAIN

BUILD AND TRACE HERE



Design name: _____

Shapes used: _____

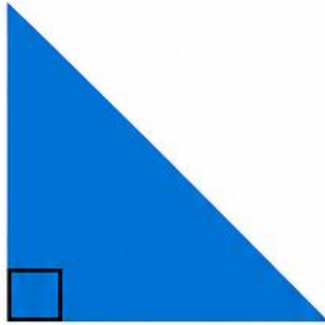
How did the pieces fit together?

SHAPE BUILDER BINGO – CALLER CARDS

Cut out the cards. Call the shape name or describe its properties. Players cover the matching shape.



EQUILATERAL TRIANGLE



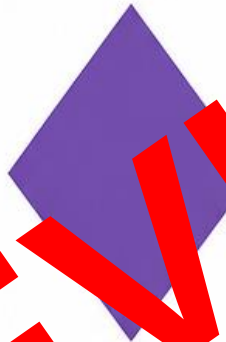
RIGHT TRIANGLE



SQUARE



RECTANGLE



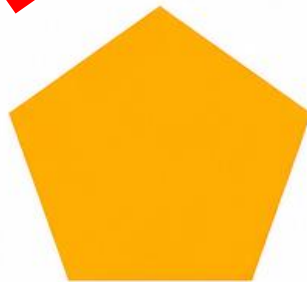
RHOMBUS



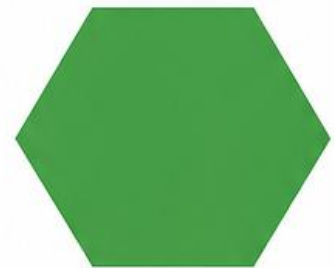
TRAPEZIUM



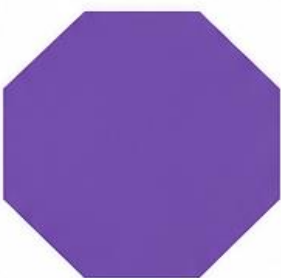
PARALLELOGRAM



PENTAGON



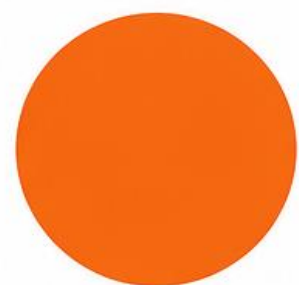
HEXAGON



OCTAGON



SEMICIRCLE



CIRCLE

PREVIEW

SHAPE BUILDER BINGO

BOARD 1

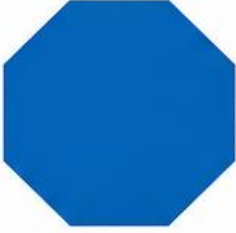
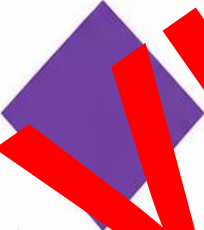


BOARD 2

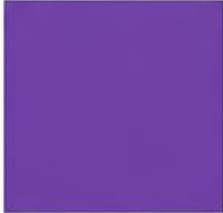
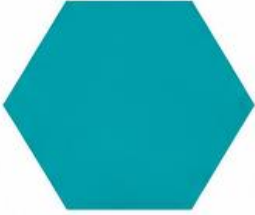


SHAPE BUILDER BINGO

BOARD 3

BOARD 4

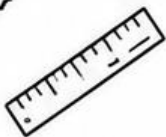
SHAPE BUILDER BINGO

BOARD 5

BOARD 6



Name: _____

Date: _____



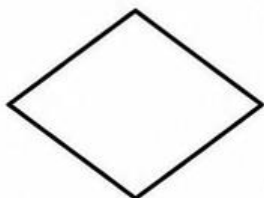
SHAPE PROPERTY MATCH

Study the numbered shape bank. Write the correct shape number beside each clue.

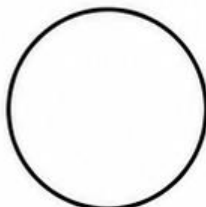
1



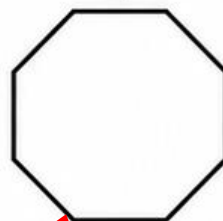
2



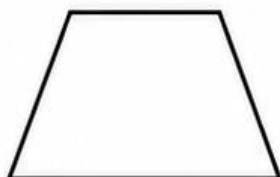
3



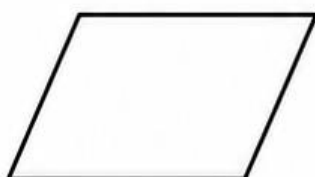
4



5



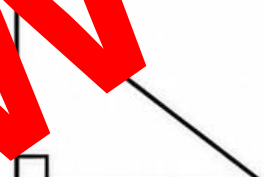
6



7



8



A

4 sides and 4 right angles,
but not all sides are equal.

Shape number: ____

B

4 equal sides. Opposite
sides are parallel.
No right angles.

Shape number: ____

C

One curved boundary
and one vertex.

Shape number: ____

D

8 equal sides and
8 equal angles.

Shape number: ____

E

Exactly one pair
of parallel sides.

Shape number: ____

F

Two pairs of parallel sides.
No right angles.
Opposite sides are equal.

Shape number: ____

G

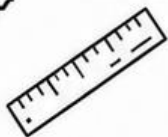
4 equal sides and
4 right angles.

Shape number: ____

H

3 sides and
one right angle.

Shape number: ____



Name: **ANSWERS**

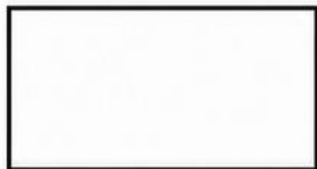
Date: _____



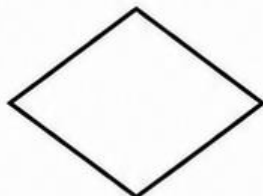
SHAPE PROPERTY MATCH

Study the numbered shape bank. Write the correct shape number beside each clue.

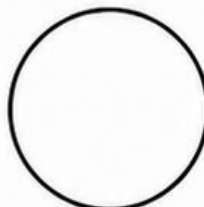
1



2



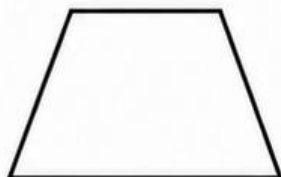
3



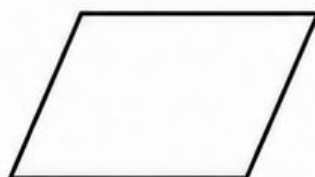
4



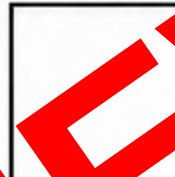
5



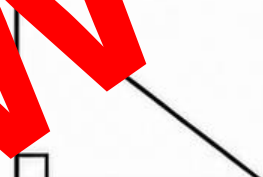
6



7



8



A

4 sides and 4 right angles,
but not all sides are equal.

Shape number: 1

B

4 equal sides. Opposite
sides are parallel.
No right angles.

Shape number: 2

C

One curved boundary
and no vertices.

Shape number: 3

D

8 equal sides and
8 equal angles.

Shape number: 4

E

Exactly one pair
of parallel sides.

Shape number: 5

F

Two pairs of parallel sides.
No right angles.
Opposite sides are equal.

Shape number: 6

G

4 equal sides and
4 right angles.

Shape number: 7

H

3 sides and
one right angle.

Shape number: 8



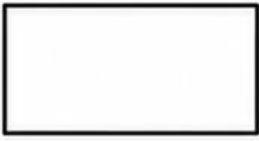
Name: _____

Date: _____

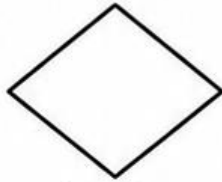


CLASSIFY AND EXPLAIN

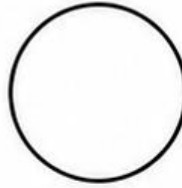
SHAPE BANK



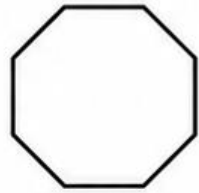
rectangle



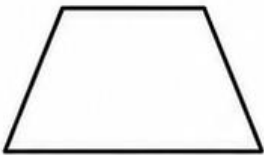
rhombus



circle



octagon



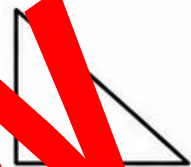
trapezium



parallelogram



square



right triangle

- 1 Write all shapes with 4 sides.

- 2 Write all shapes with at least one pair of parallel sides.

- 3 Write all shapes with all sides equal.

- 4 Which shape has exactly one pair of parallel sides?

- 5 Which shape has no vertices?

- 6 Which shape has one right angle?

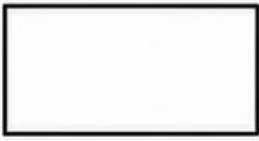
A square is also a rectangle. Explain why.

Name: **ANSWERS**

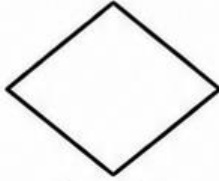
Date: _____

CLASSIFY AND EXPLAIN

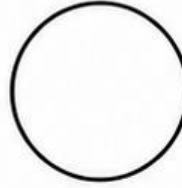
SHAPE BANK



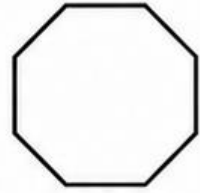
rectangle



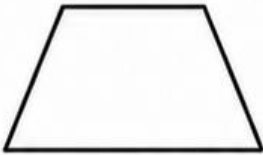
rhombus



circle



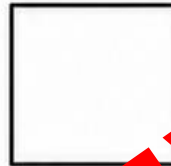
octagon



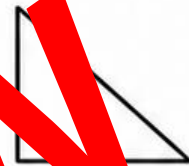
trapezium



parallelogram



square

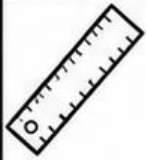


right triangle

- 1 Write all shapes with 4 sides.
rectangle, rhombus, trapezium, parallelogram, square
- 2 Write all shapes with at least one pair of parallel sides.
rectangle, rhombus, trapezium, parallelogram, square
- 3 Write all shapes with all sides equal.
rhombus, octagon, square
- 4 Which shape has exactly one pair of parallel sides?
trapezium
- 5 Which shape has no vertices?
circle
- 6 Which shape has one right angle?
right triangle

A square is also a rectangle. Explain why.

A square has four right angles, so it is a rectangle. All four of its sides also
happen to be equal.



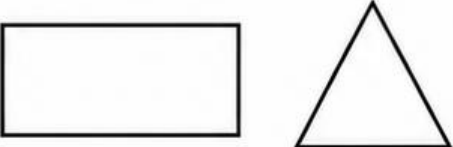
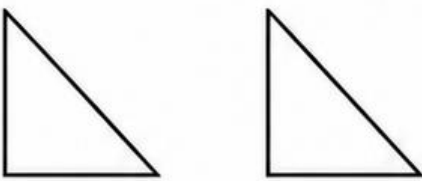
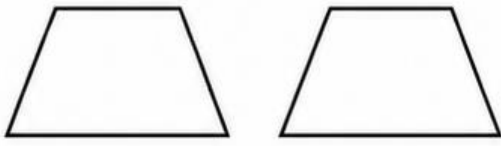
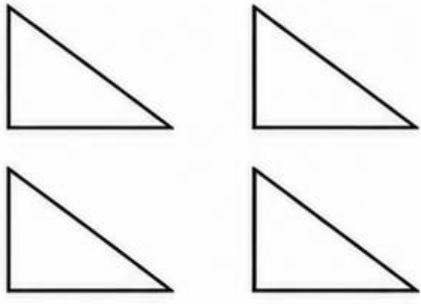
Name: _____

Date: _____

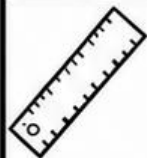


COMBINING SHAPES – CORE

Draw the outside outline made when each set of pieces is joined along a full edge.
Then name the possible composite shape.

1.		➔	Composite outline Possible name: _____
2.		➔	Composite outline Possible name: _____
3.		➔	Composite outline Possible name: _____
4.		➔	Composite outline Possible name: _____
5.		➔	Composite outline Possible name: _____

PREVIEW

Name: ANSWERS

Date: _____



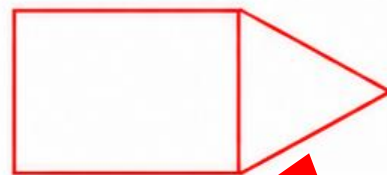
COMBINING SHAPES – CORE

Draw the outside outline made when each set of pieces is joined along a full edge.
Then name the possible composite shape.

1.



Composite outline

Possible name: pentagon

2.



Composite outline

Possible name: square

3.



Composite outline

Possible name: pentagon

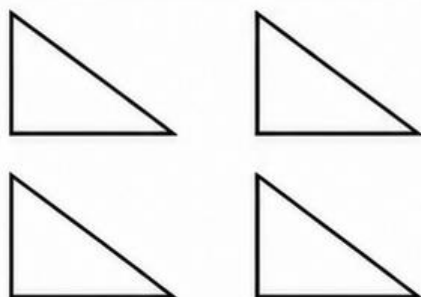
4.



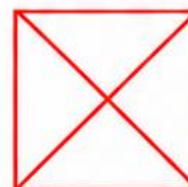
Composite outline

Possible name: hexagon

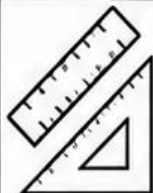
5.



Composite outline

Possible name: square

PREVIEW



Name: _____

Date: _____



COMPOSITE DESIGN CHALLENGE

Design a robot or machine using at least 6 familiar 2D shapes.
Pieces may touch but must not overlap.

Shape	How many?

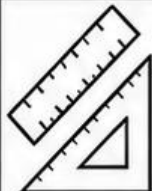
MY COMPOSITE DESIGN

Total pieces _____

Two shapes I combined were _____

The shared edge worked because _____





Name: ANSWERS

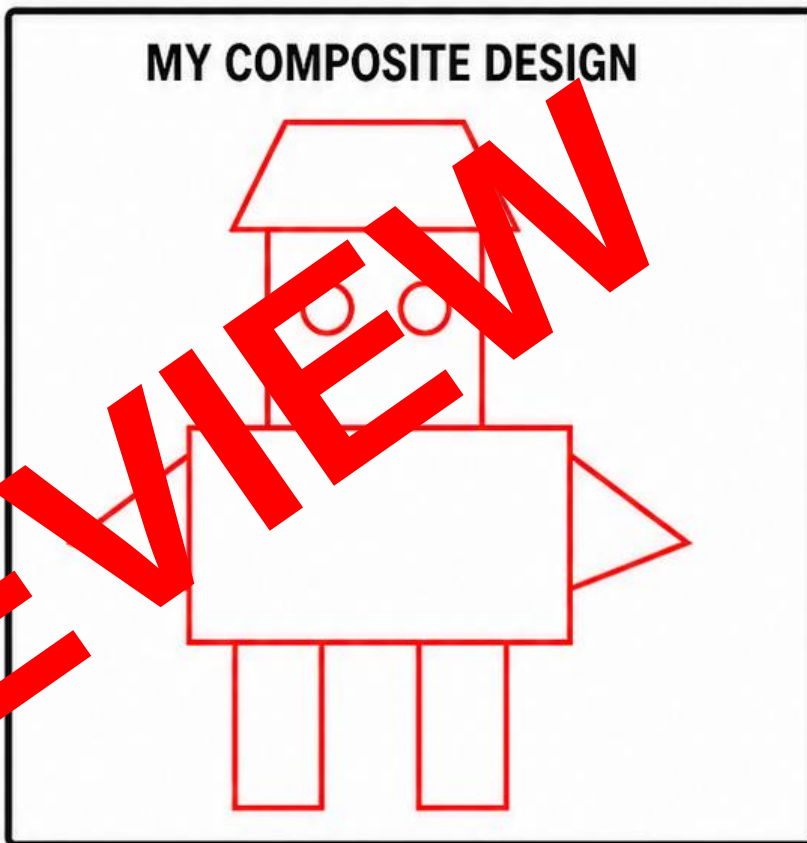
Date: _____



COMPOSITE DESIGN CHALLENGE

Design a robot or machine using at least 6 familiar 2D shapes.
Pieces may touch but must not overlap.

Shape	How many?
Square	1
Rectangle	3
Circle	2
Triangle	2
Trapezium	1



Total pieces 9

Two shapes I combined were a square and a triangle.

The shared edge worked because the sides were equal lengths.





Name: _____

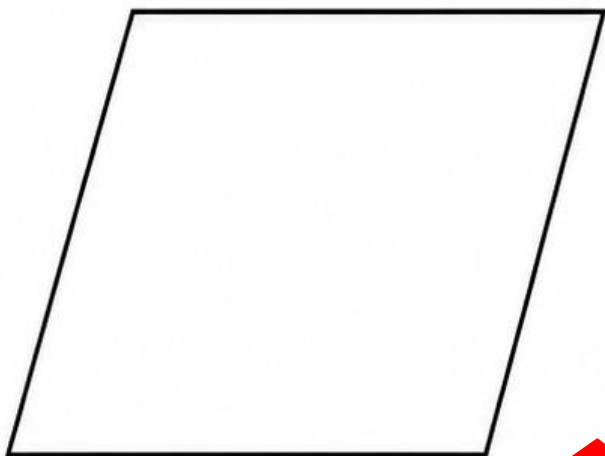
Date: _____



SPLITTING SHAPES – CORE

Draw straight dividing lines to split each shape as requested. Label every new piece.

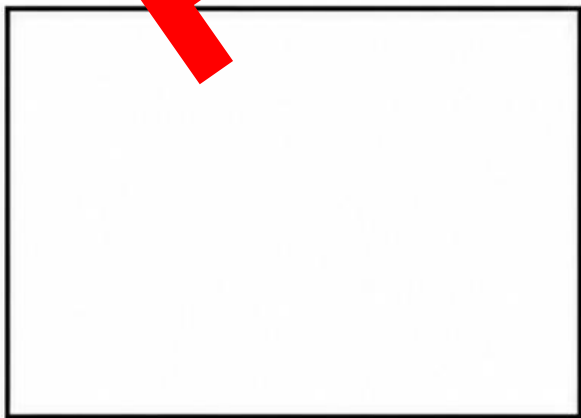
A. Make 1 rectangle and 2 congruent triangles.



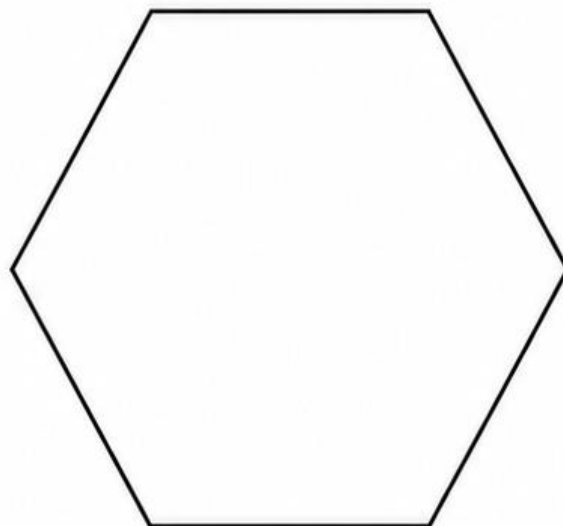
B. Make 1 triangle and 1 quadrilateral.

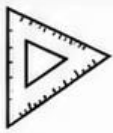


C. Make 2 congruent triangles.



D. Make 6 congruent triangles.





Name: _____

ANSWERS

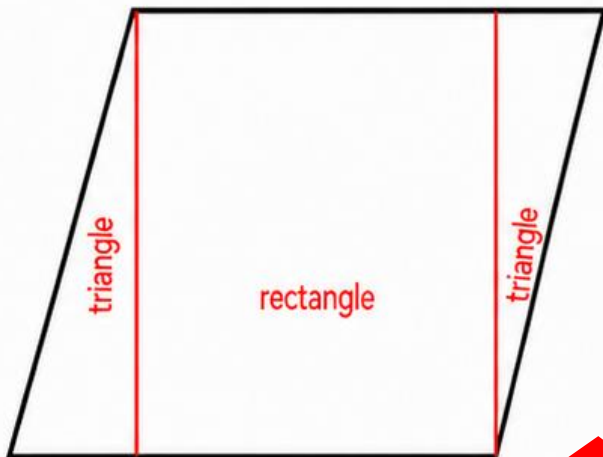
Date: _____



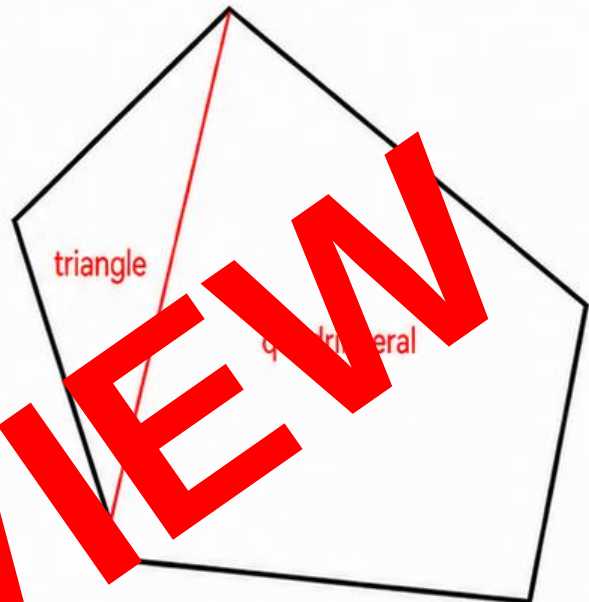
SPLITTING SHAPES – CORE

Draw straight dividing lines to split each shape as requested. Label every new piece.

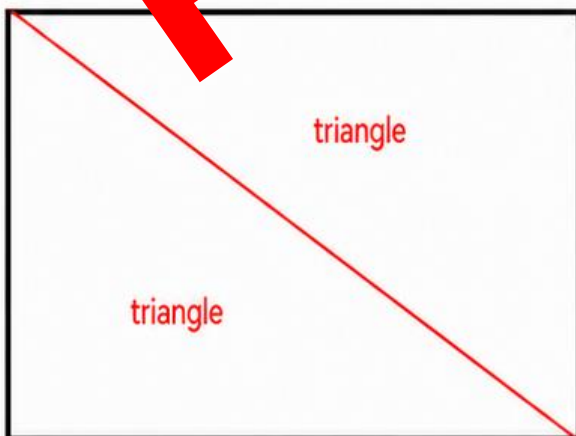
- A. Make 1 rectangle and 2 congruent triangles.



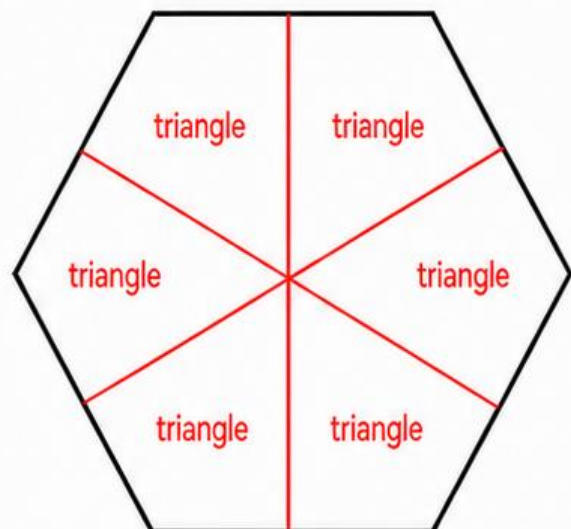
- B. Make 1 triangle and 1 quadrilateral.



- C. Make 2 congruent triangles.



- D. Make 6 congruent triangles.





Name: _____

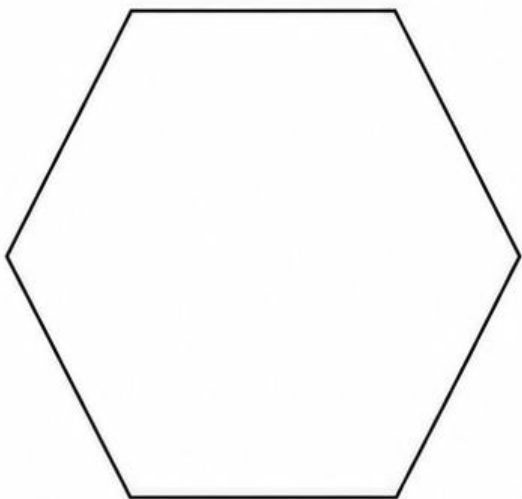
Date: _____



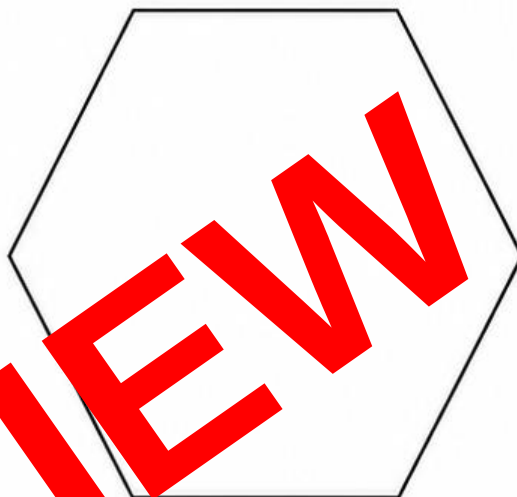
ONE HEXAGON, MANY PARTITIONS

Draw straight dividing lines to partition each regular hexagon in a different way. Label the pieces.

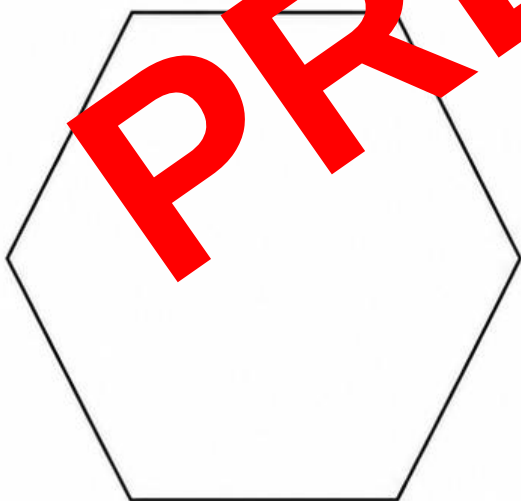
A. Make 6 congruent triangles.



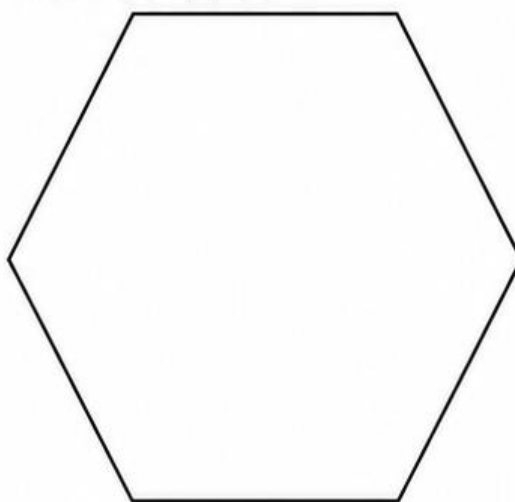
B. Make 2 congruent trapeziums.



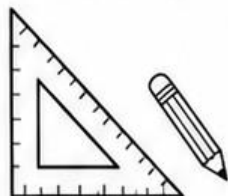
C. Make 3 congruent rhombi.



D. Invent another valid partition.
Name every piece.



How do you know your pieces rebuild the original hexagon? _____





Name: **ANSWERS**

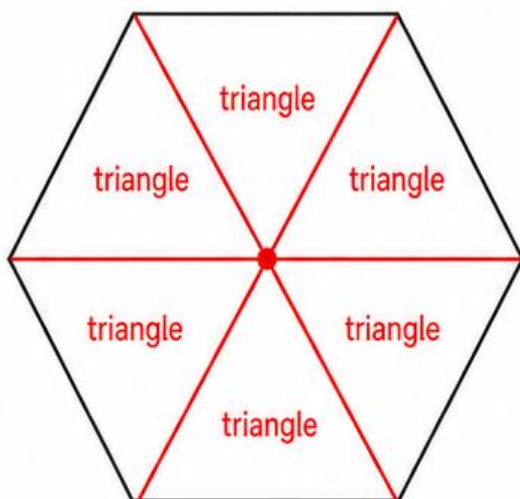
Date: _____



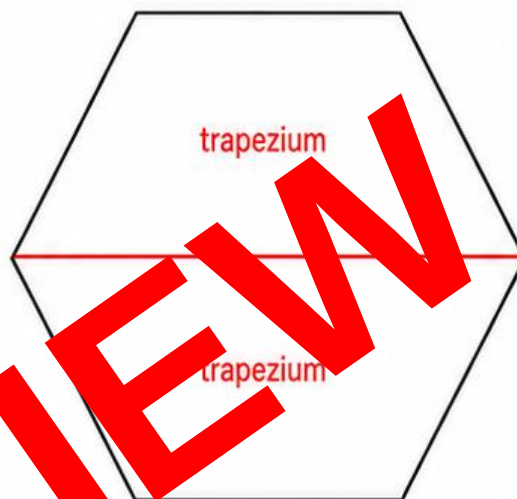
ONE HEXAGON, MANY PARTITIONS

Draw straight dividing lines to partition each regular hexagon in a different way. Label the pieces.

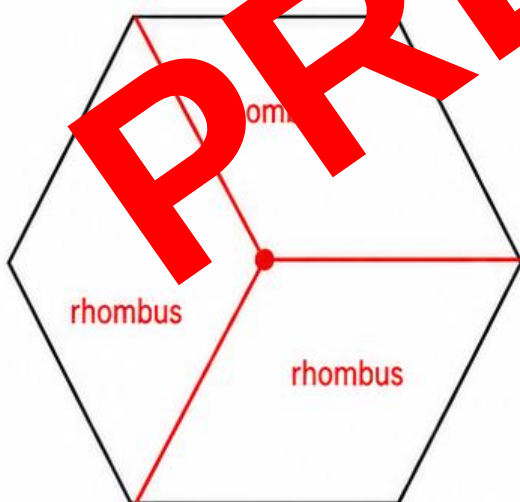
A. Make 6 congruent triangles.



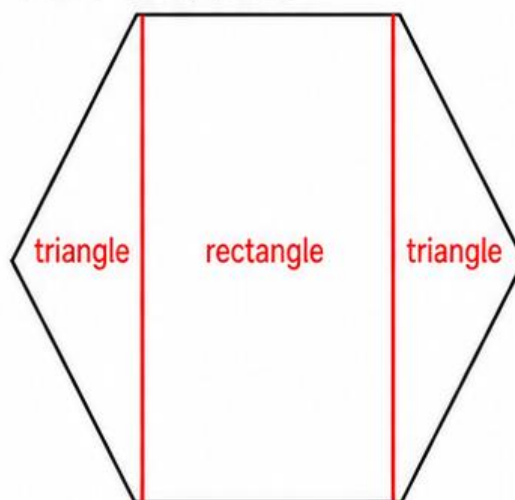
B. Make 2 congruent trapeziums.



C. Make 3 congruent rhombi.

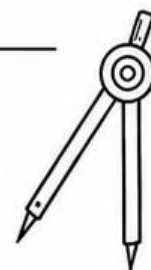
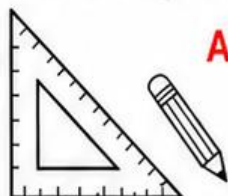


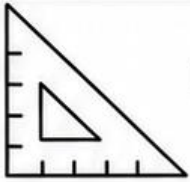
D. Invent another valid partition.
Name every piece.



How do you know your pieces rebuild the original hexagon? _____

All the pieces fill the same boundary with no gaps or overlaps.





Name: _____

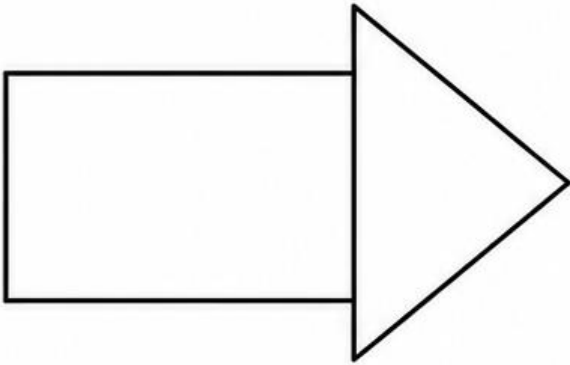
Date: _____



COMPOSITE SHAPE DETECTIVE

Study each composite shape. Identify its component shapes, count its outside sides, and describe one property.

A.

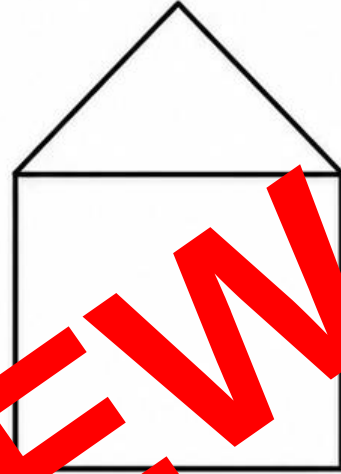


Component shapes: _____

Outside sides: _____

One property: _____

B.

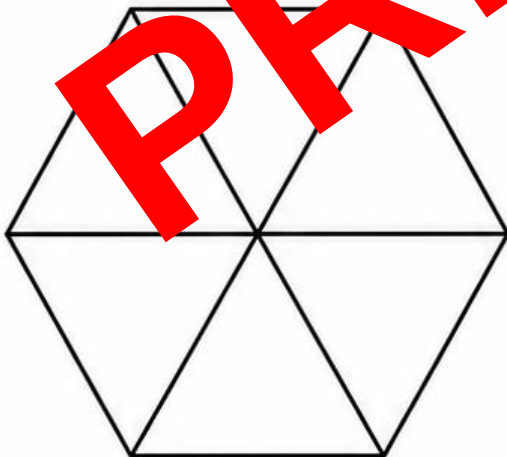


Component shapes: _____

Outside sides: _____

One property: _____

C.

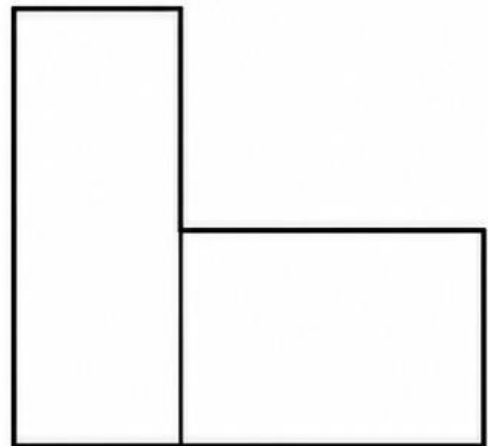


Component shapes: _____

Outside sides: _____

One property: _____

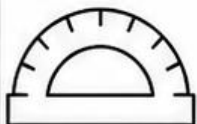
D.

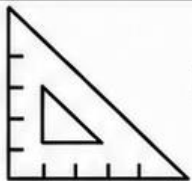


Component shapes: _____

Outside sides: _____

One property: _____





Name: **ANSWERS**

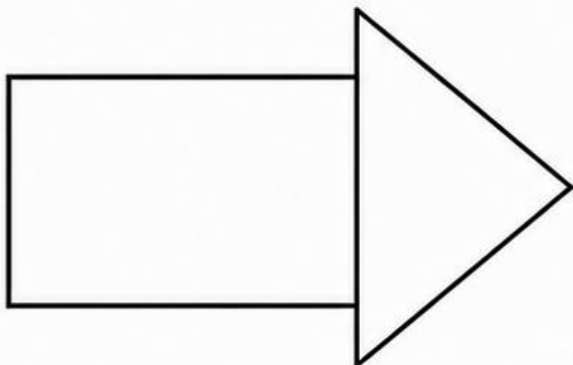
Date: _____



COMPOSITE SHAPE DETECTIVE

Study each composite shape. Identify its component shapes, count its outside sides, and describe one property.

A.



Component shapes: **rectangle, triangle**

Outside sides: **5**

One property: **one pair of parallel sides**

B.

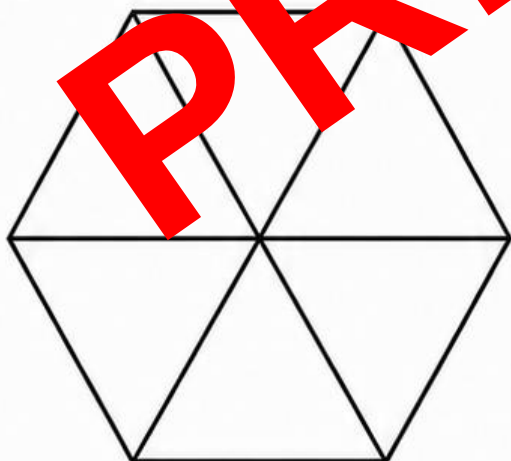


Component shapes: **square, triangle**

Outside sides: **5**

One property: **two equal sloping sides**

C.

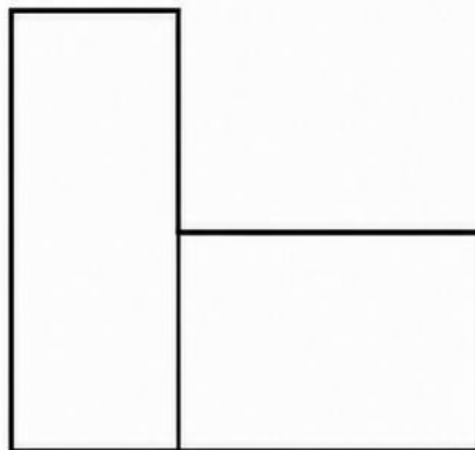


Component shapes: **6 triangles**

Outside sides: **6**

One property: **six equal outer sides**

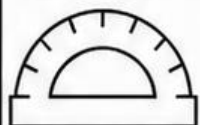
D.

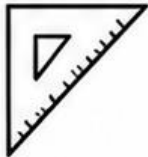


Component shapes: **2 rectangles**

Outside sides: **6**

One property: **all angles are right angles**





Name: _____

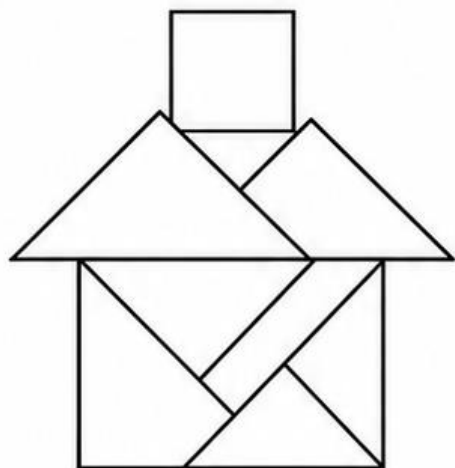
Date: _____



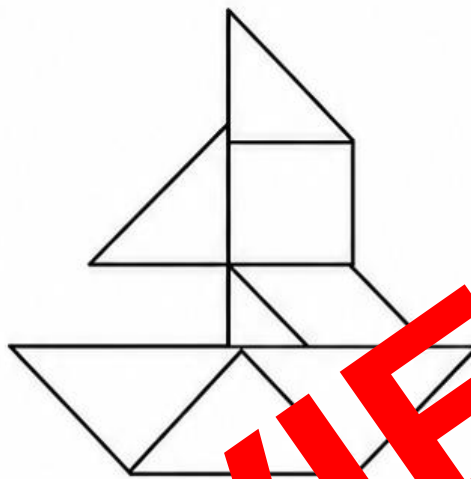
TANGRAM REASONING

Study the tangram designs. Every design uses all 7 standard tangram pieces without overlaps.

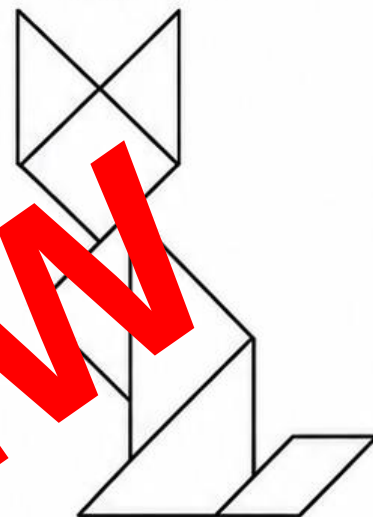
HOUSE



BOAT



CAT



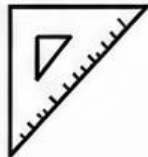
1. Circle the five triangles in each design.
2. Name the two quadrilateral pieces: _____ and _____
3. How did rotating or flipping a piece change its orientation?

4.

MY 7-PIECE TANGRAM SILHOUETTE

I made a _____





Name: ANSWERS

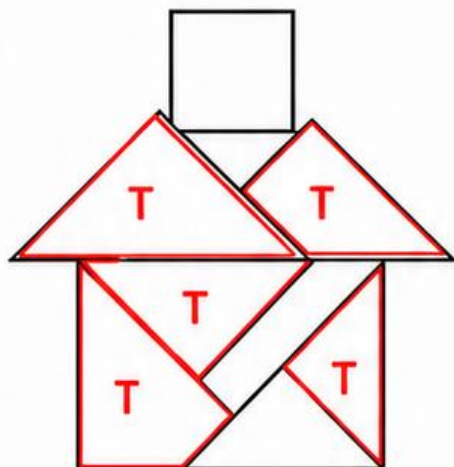
Date: _____



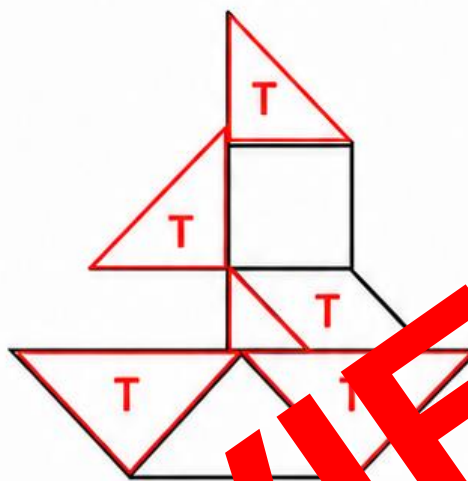
TANGRAM REASONING

Study the tangram designs. Every design uses all 7 standard tangram pieces without overlaps.

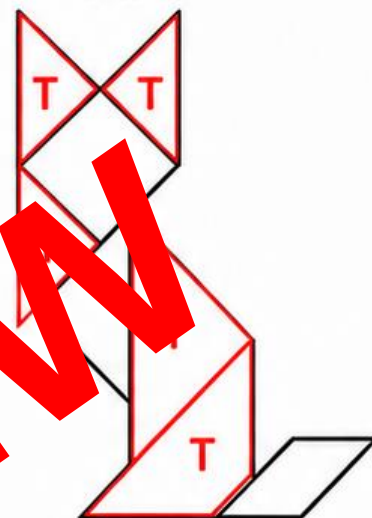
HOUSE



BOAT



CAT

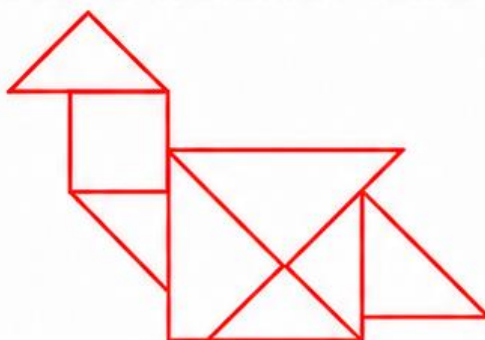


1. Circle the five triangles in each design.
2. Name the two quadrilateral pieces: square and parallelogram
3. How did flipping or rotating a piece change its orientation?

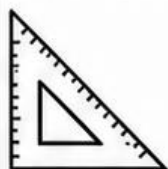
It changed the direction the piece faced, not its size or shape.

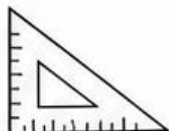
4.

MY 7-PIECE TANGRAM SILHOUETTE



I made a bird





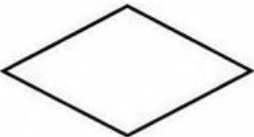
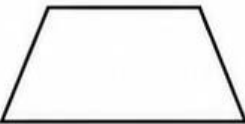
Name: _____

Date: _____



SHAPE STUDIO DESIGN CHALLENGE – PAGE 1

PART A — DESCRIBE PROPERTIES

Shape	Sides	Right angles	Pairs of parallel sides
			
			
			
			

PART B — COMBINE SHAPES

Join each set along a full edge. Draw the outside outline and name one possible composite shape.

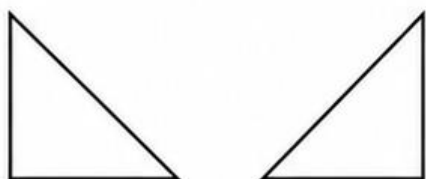
1.



Possible shape: _____

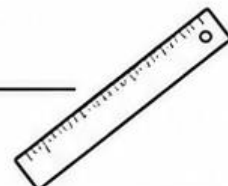
Why does the shared edge fit? _____

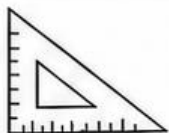
2.



Possible shape: _____

Why does the shared edge fit? _____



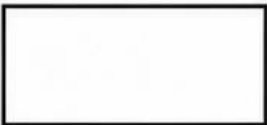
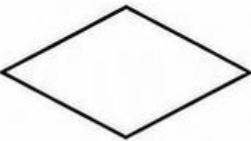
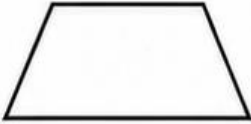
Name: **ANSWERS**

Date: _____



SHAPE STUDIO DESIGN CHALLENGE – PAGE 1

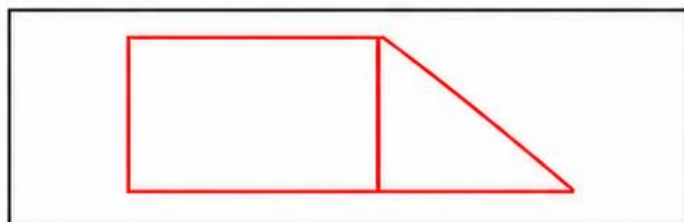
PART A — DESCRIBE PROPERTIES

Shape	Sides	Right angles	Pairs of parallel sides
	4	4	2
	4	4	2
	4	0	2
	4	0	1

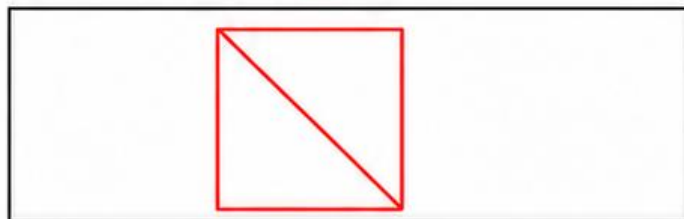
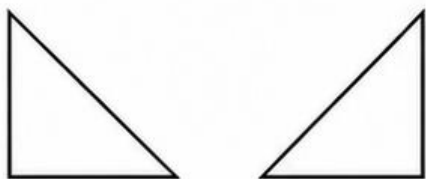
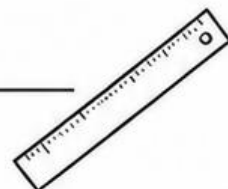
PART B — COMBINE SHAPES

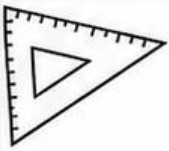
Join each set along a full side. Draw the outside outline and name one possible composite shape.

1.

Possible shape: trapeziumWhy does the shared edge fit? The shared sides are the same length.

2.

Possible shape: squareWhy does the shared edge fit? The shared sides are the same length.



Name: _____

Date: _____

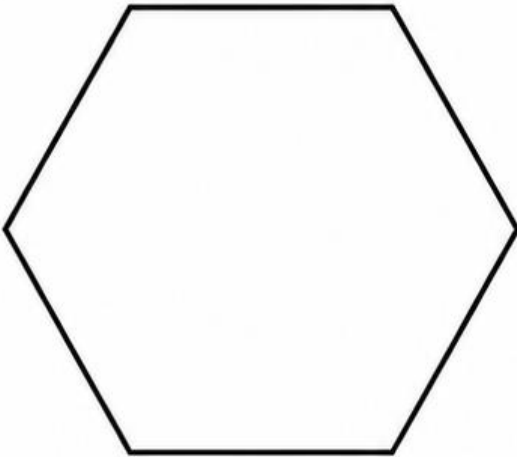


SHAPE STUDIO DESIGN CHALLENGE – PAGE 2

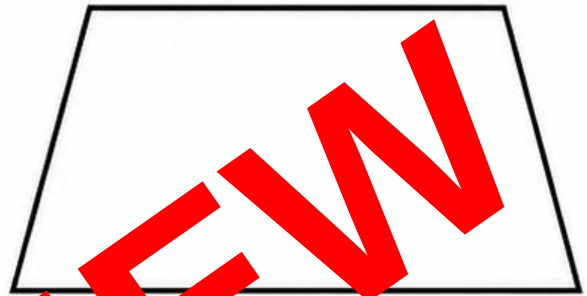
PART C — SPLIT SHAPES

Draw straight dividing lines and label every new piece.

1. Make 6 congruent triangles.



2. Make 1 rectangle and 2 congruent trapeziums.



PART D — DESIGN AND EXPLAIN

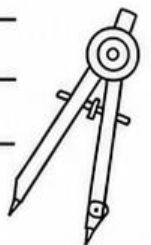
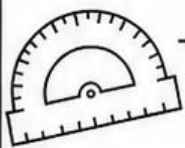
Design a park logo using at least 3 similar 2D shapes. Pieces may touch but must not overlap.

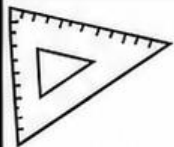
PARK LOGO

Shapes used: _____

Total pieces: _____

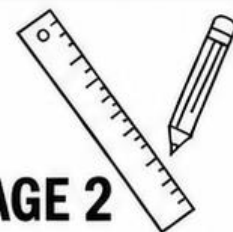
Describe one property of your finished outline: _____





Name: ANSWERS

Date: _____

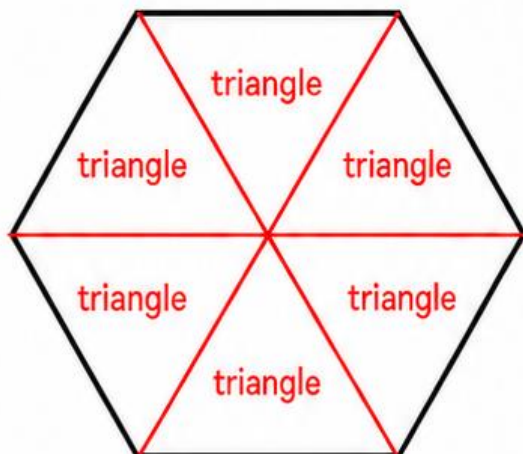


SHAPE STUDIO DESIGN CHALLENGE – PAGE 2

PART C — SPLIT SHAPES

Draw straight dividing lines and label every new piece.

1. Make 6 congruent triangles.

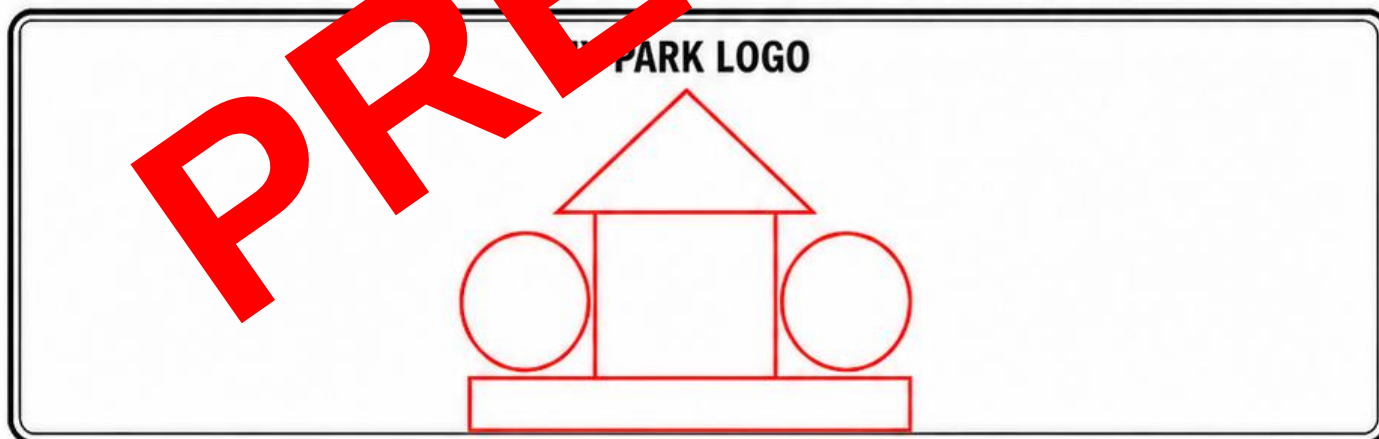


2. Make 1 rectangle and 2 congruent trapeziums.



PART D — DESIGN AND EXPLAIN

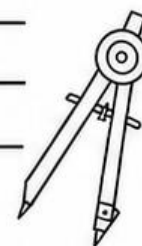
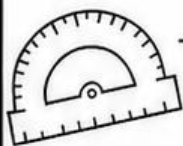
Design a park logo using at least 3 similar 2D shapes. Pieces may touch but must not overlap.

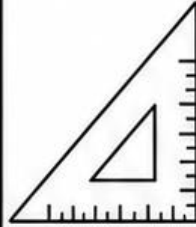


Shapes used: square, triangle, rectangle, 2 circles

Total pieces: 5

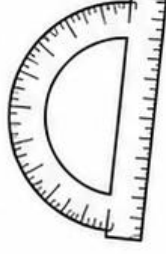
Describe one property of your finished outline: It has straight sides, right angles and curved boundaries.





Name: _____

Date: _____



CREATING 2D SHAPES RUBRIC

Criteria	BEGINNING	DEVELOPING	ACHIEVING	CONFIDENT	EXCEEDING
Describes properties	Names few properties.	Names some properties and sides of angles.	Accurately describes key properties.	Compares properties precisely.	Justifies classifications using properties.
Combines shapes	Needs support to join pieces.	Joins some pieces correctly.	Builds valid composite shapes.	Builds and explains varied composites.	Creates efficient, complex composites.
Splits shapes	Needs support to partition.	Makes a partly valid partition.	Splits shapes as requested.	Finds several valid partitions.	Generalises and justifies partitions.
Explains reasoning	Gives little explanation.	Uses simple shape words.	Explains using relevant properties.	Connects pieces, edges and outlines.	Uses precise, convincing reasoning.
Accuracy and presentation	Work is incomplete.	Some lines or labels are unclear.	Work is accurate and clear.	Work is precise and well labelled.	Work is meticulous and insightful.



Creating 2D Shapes

PREVIEW



Our learning goal

Identify and describe 2D shapes and properties.

Compare and sort familiar shapes.

Explain why we use construction or partition works.

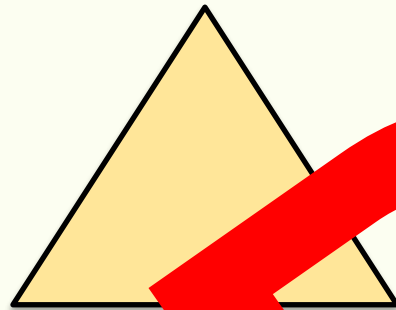


A quick 2D-shape recap

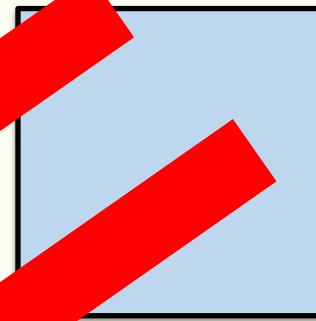
2D shapes are flat and closed.

Their boundaries may be straight, curved, or both.

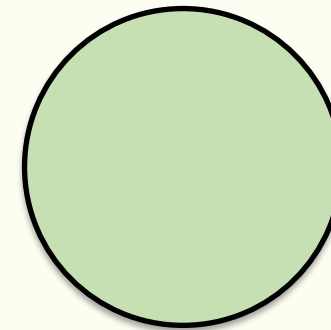
Sides meet at vertices; a circle has no vertices.



triangle



square



circle



Properties help us classify

Count sides and vertices

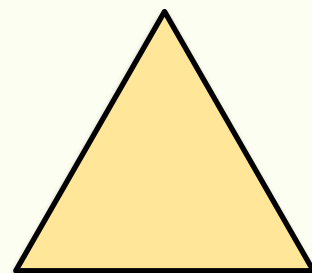
Look for equal lengths, parallel sides and right angles.

Use more than one property when shapes look similar.

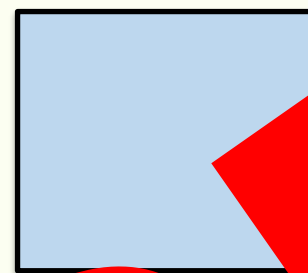


Compare familiar shapes

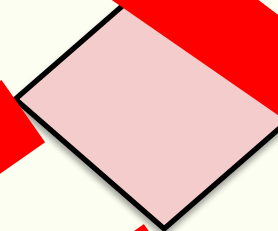
A shape belongs to a group because of its properties – not because of its size, colour or direction.



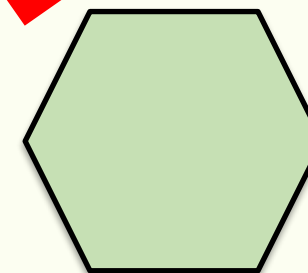
triangle



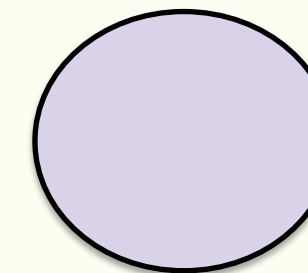
rectangle



rhombus



hexagon



circle



Combining shapes

Join pieces along full edges.

Keep every piece visible. No gaps and no overlaps.

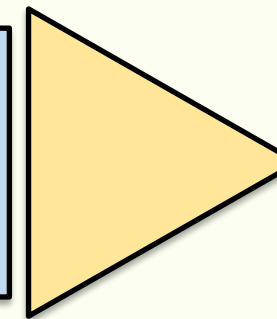
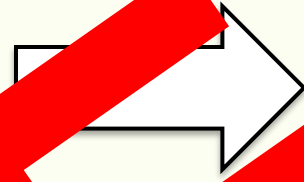
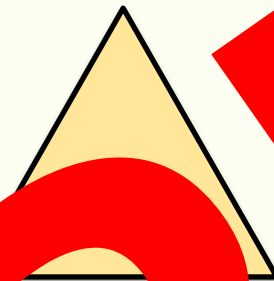
Trace the outside boundary to name the composite.



Rectangle plus triangle

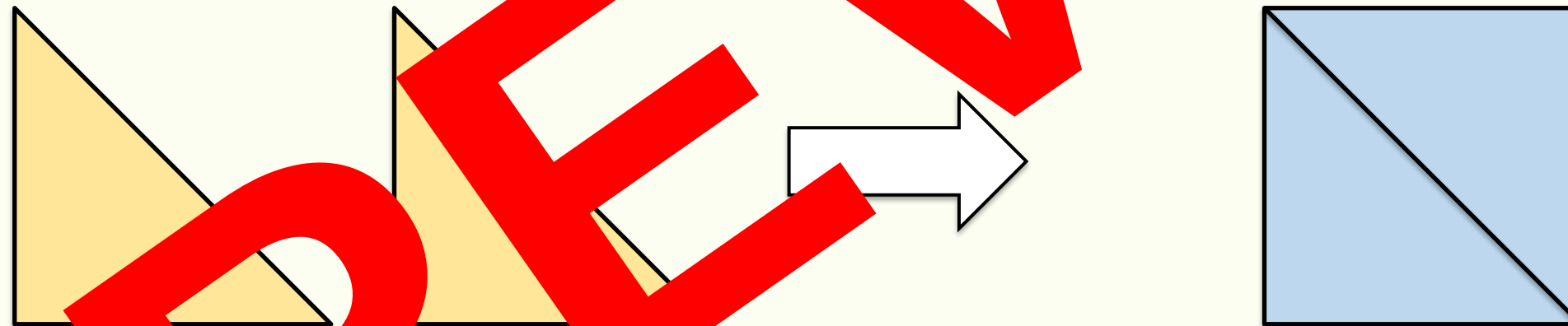
Match one full side of the triangle to one side of the rectangle.

The outside boundary can form an arrow-like composite.



Two congruent right triangles

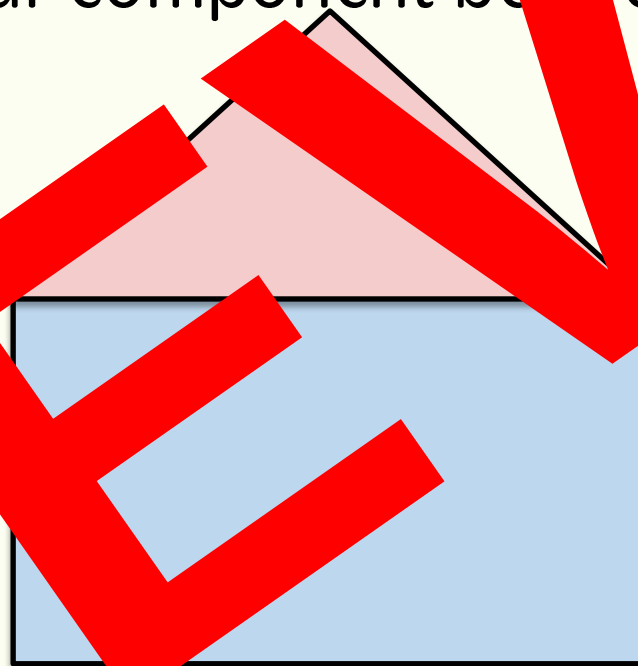
Congruent means exactly the same size and shape.
Join matching sides to make a square or rectangle.



Composite-shape detective

Look for shared edges inside the large outline

Name each familiar component before naming the outside shape.



square + triangle



Splitting shapes

Draw straight dividing lines inside the outline.

Check that every new piece is a familiar shape.

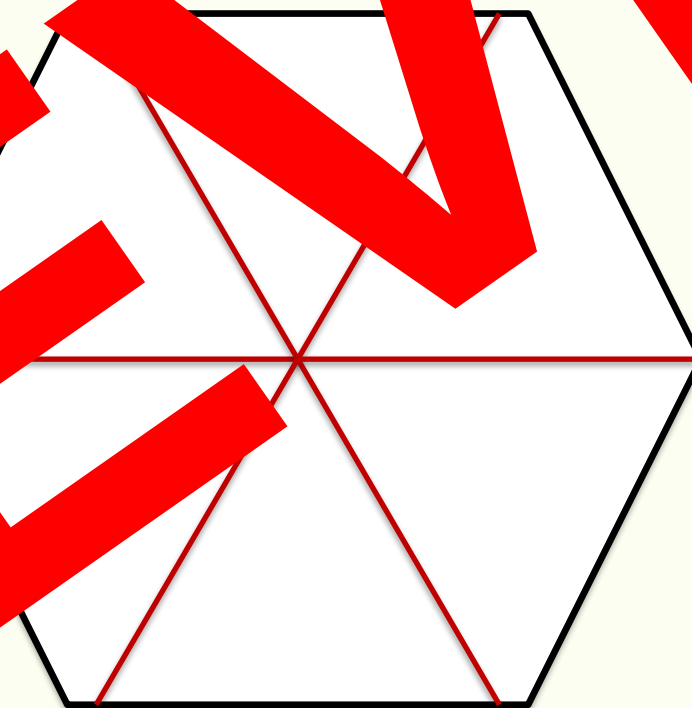
The pieces must rebuild the original with no gaps or overlaps.



One hexagon, several partitions

A regular hexagon can become six triangles, two trapeziums or three rhombi.

Different correct partitions can describe the same whole.



Tangrams

A tangram has seven pieces: five triangles, one square and one parallelogram.

Every piece is used once with no overlaps.



Build a tangram figure

Slide pieces to change position.

Rotate pieces to change direction.

Flip the parallelogram when a mirror image is needed.



Plan, build, check, explain

PLAN which pieces and shared edges you need.

BUILD with no gaps or overlaps.

CHECK the outside boundary.

EXPLAIN using precise shape properties.

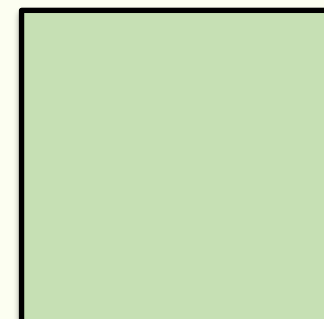
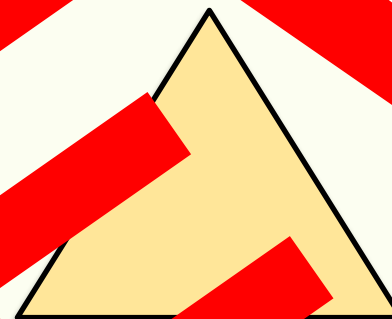
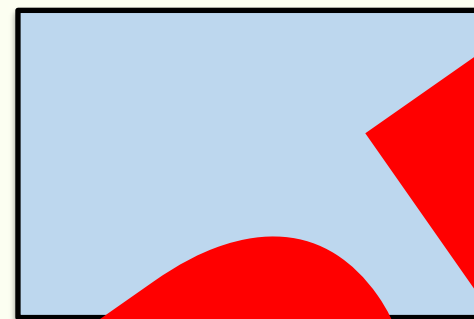


Guided practice: combine

Use all three pieces.

Choose full edges that match.

Be ready to name the outside shape and justify your choice.



How could you combine all three?

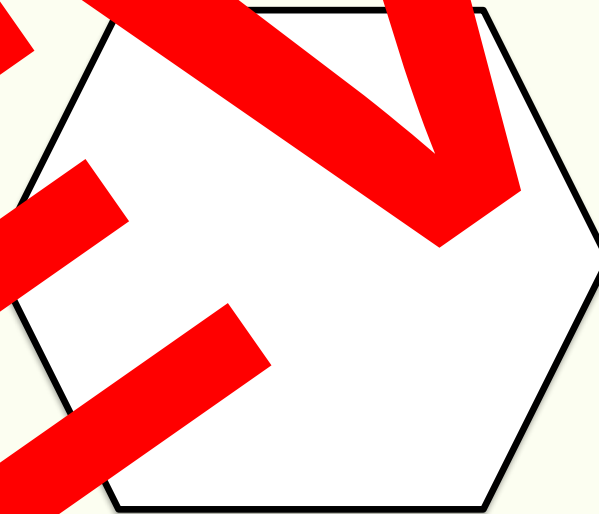


Guided practice: split

Partition the hexagon in two different ways.

Label every component shape.

Explain how both sets rebuild the same whole.



Show two different valid partitions.



Explain your reasoning

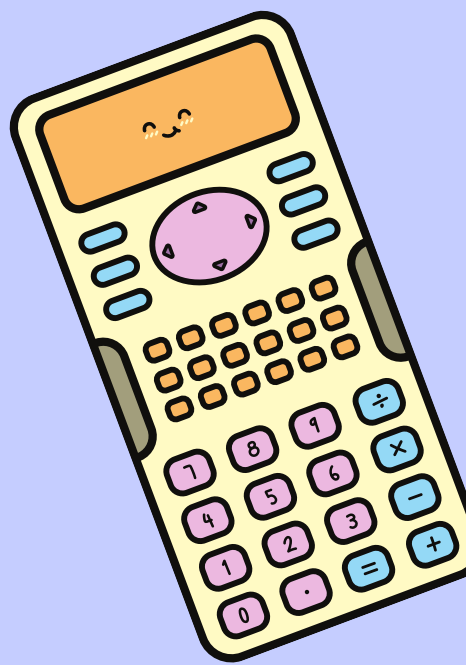
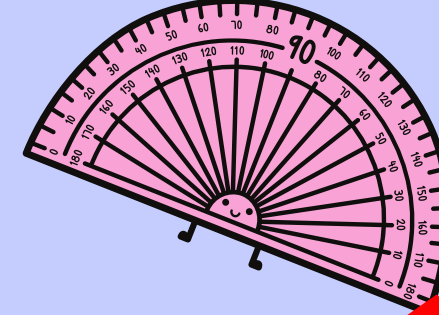
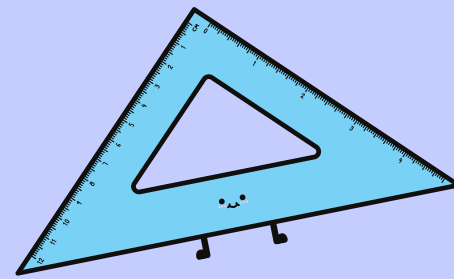
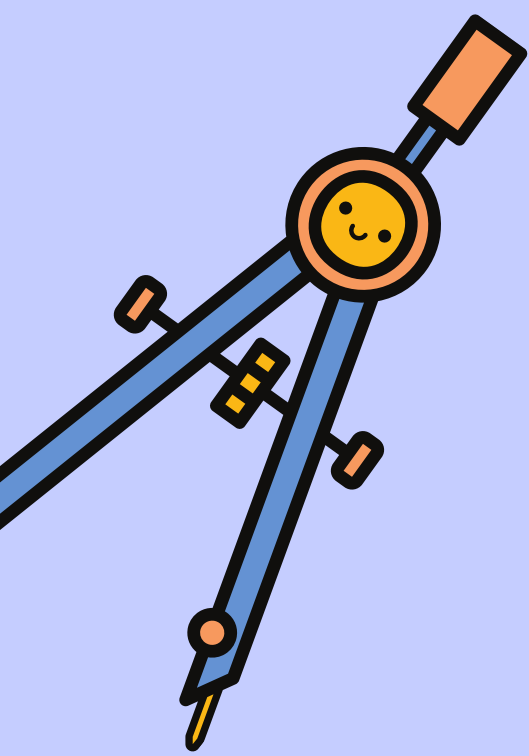
Name every component shape.

Describe the shape and dividing edges.

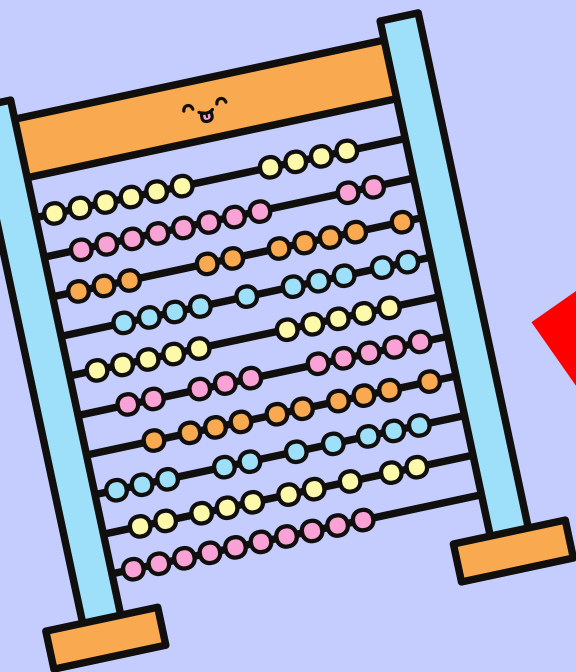
Use sides, vertices, angles and parallel lines as evidence.

Check the outline for gaps or overlaps.

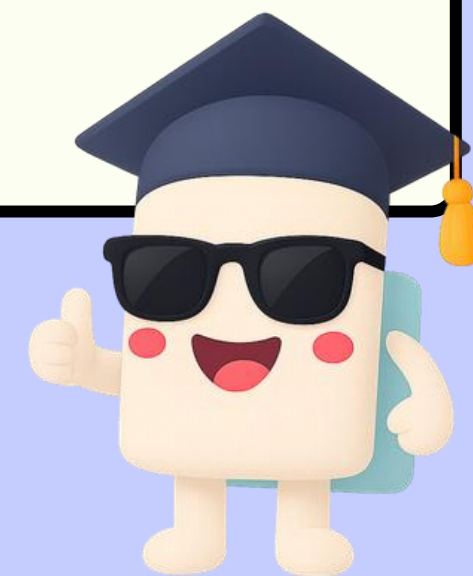
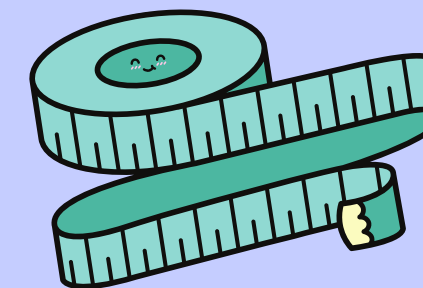
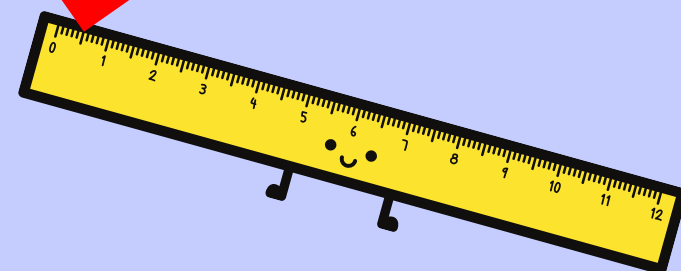




Well Done!



PREVIEW



Creating 2D Shapes Quiz



Question 1

True or false?

Two congruent right triangles can combine to make a square.



Answer 1

ue.
Join the triangles along their hypotenuse to form a square.



Question 2

How many sides does a hexagon have?

A. 4

B. 5

C. 6

D. 8



Answer 2

Q 6

A hexagon has six straight sides and six vertices.



Question 3

Name one possible composite made by joining a rectangle and a triangle along a full edge.



Answer 3

An arrow-like composite is one valid answer.
A different valid construction may have another outside name.



Question 4

Which property is true of every square but not every rectangle?

- A. Four sides
- B. Four right angles
- C. Four equal sides
- D. Two pairs of parallel sides



Answer 4

3. Four equal sides

Every square has four equal sides, rectangle does not have to.



Question 5

True or false?

A composite shape is made from only one familiar shape.



Answer 5

else.
A composite shape is made by combining two or more shapes.



Question 6

Give one valid way to split a parallelogram into familiar shapes.



Answer 6

One valid answer is rectangle and two congruent triangles.
Other correct partitions are possible.



Question 7

How many pieces are in a standard tangram?

A. 5

B. 6

C. 7

D. 8



Answer 7

Answer 7
Five triangles, one square and one parallelogram.



Question 8

True or false?

The same shape can be split in more than one valid way.



Answer 8

ue.
Different dividing lines can produce different familiar component shapes.



Question 9

What should you check about combining shapes?

- A. The colour changed
- B. The outline matches and there are no gaps or overlaps
- C. Every piece is a circle
- D. The pieces are different sizes



Answer 9

B. Check the outside outline and make sure there are no gaps or overlaps.



Question 10

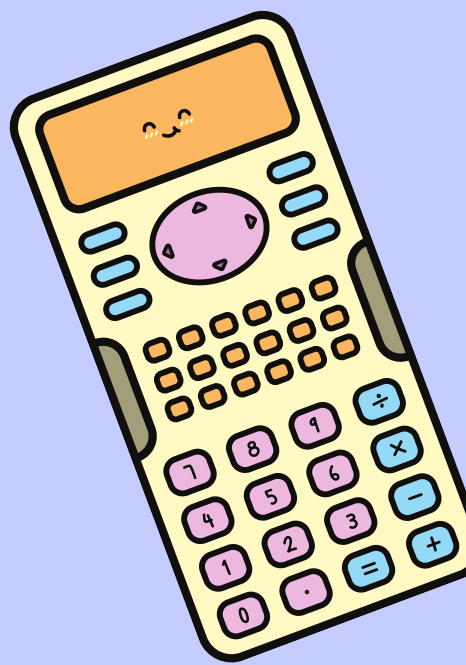
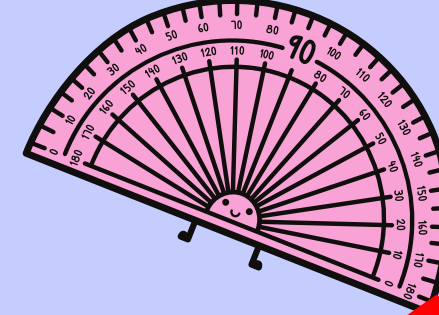
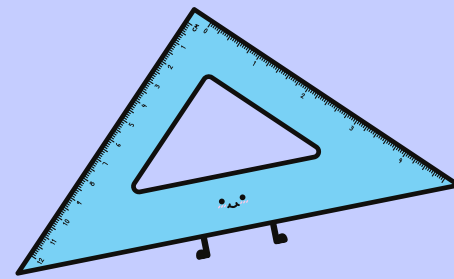
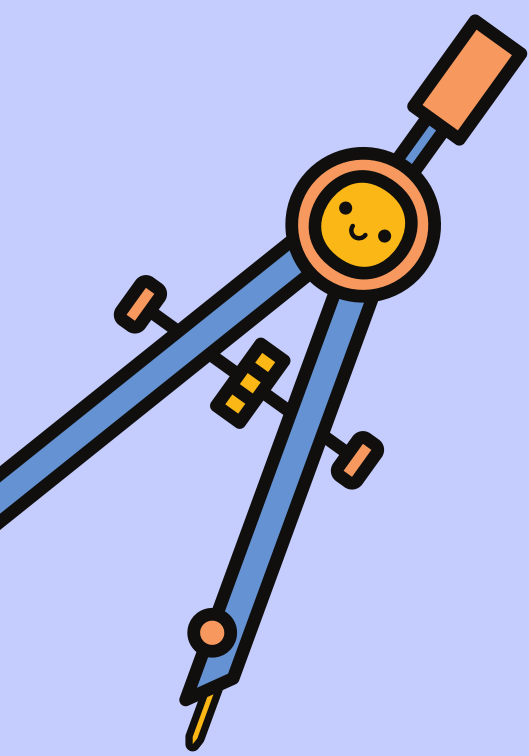
Describe one valid way to find a regular heptagon from smaller familiar shapes.



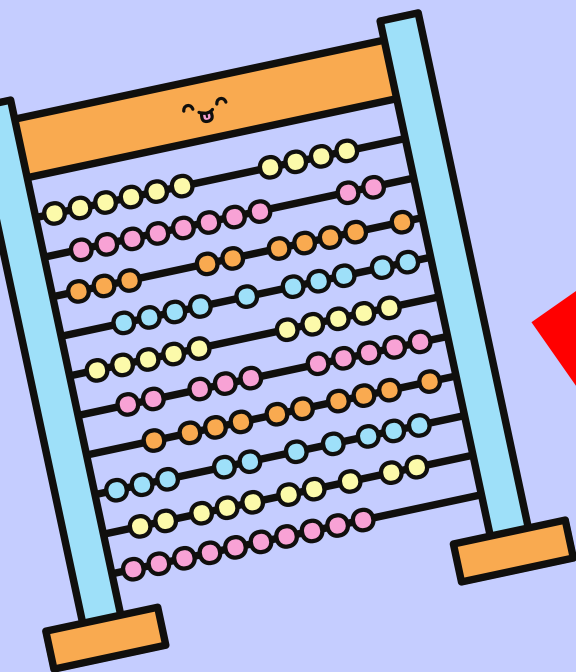
Answer 10

Join six congruent equilateral triangles so that their points meet at the centre.





Well Done!



PREVIEW

