

# Combine, Split Two-dimensional Shapes.

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## Differentiate and Assess

Not every student will be ready to investigate this concept at this Level and so we will need to differentiate to ensure every student is learning at their leading edge. Select the Differentiate button on this screen.

## Integrate

Every mathematical concept is integrally related to other mathematical concepts. Teaching and learning related concepts simultaneously develops deep relational understanding. Select the Integrate button on this screen.

## Intervene

Some students may not yet be ready to investigate this concept at any Level, and so we will need to provide some intervention. Select the Intervention button on this screen.

# COMBINE, SPLIT TWO-DIMENSIONAL SHAPES.

## EXPLICIT TEACHING PLAN OVERVIEW PAGE

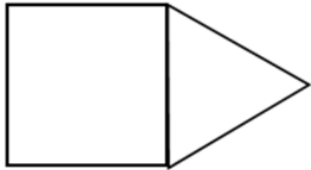
THIS PAGE IS A SUMMARY OF THE EXPLICIT TEACHING PLAN, INCLUDING STRATEGIC QUESTIONS, AND DESCRIBING THE SEQUENCE WHICH WILL OCCUR OVER MULTIPLE LESSONS.

RESOURCES: TWO-DIMENSIONAL SHAPES, RULER, ANGLES TESTERS, SCISSORS, PENCIL, PAPER

### WHAT COULD WE DO?

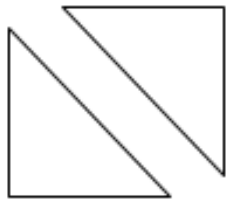
Children:

- combine shapes to create new shapes, describing and naming the shapes, for example,

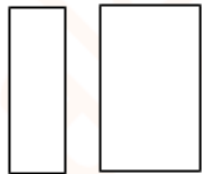


5 unequal sides, 5 unequal vertices,  
irregular pentagon

- split shapes to create new shapes, describing and naming the shapes, for example,



3 sides, 3 vertices, 2 equal sides, 2  
triangles



4 sides, 4 vertices, opposite sides  
equal and parallel, 2 rectangles

### WHAT LANGUAGE COULD WE USE TO EXPLAIN AND ASK QUESTIONS?

Children

- ask one another questions about combining and splitting shapes to create new shapes, naming and describing the shapes, for example:
  - ▶ What shapes are we combining?
  - ▶ How could we describe the new shape?
  - ▶ How could we name the new shape?
  
- ▶ What shape are we splitting?
- ▶ How could we describe the new shape?
- ▶ How could we name the new shape?

# COMBINE, SPLIT TWO-DIMENSIONAL SHAPES.

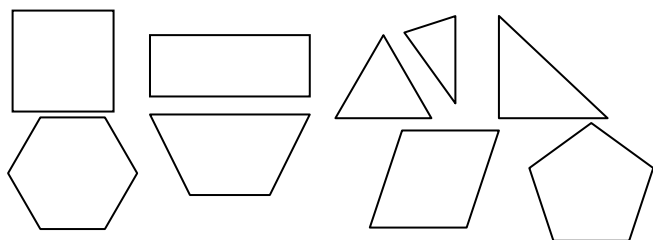
## EXPLICIT TEACHING PLAN

FULL EXPLICIT TEACHING PLAN, EMBEDDING DEEP RELATIONAL UNDERSTANDING, METALANGUAGE, AND QUESTIONS THAT MAY BE USED OVER MULTIPLE LESSONS.

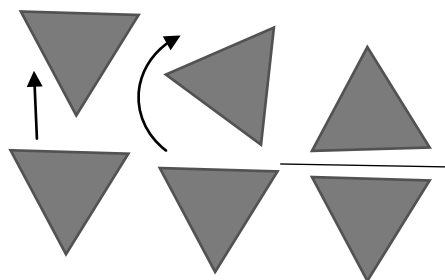
### WHAT COULD WE DO?

Children think about, talk and listen to a friend about, then have the opportunity to share what they already know.

Display a [range of two-dimensional shapes](#), for example,



Translate, rotate and reflect a two-dimensional shape, for example,



### WHAT LANGUAGE COULD WE USE TO EXPLAIN AND ASK QUESTIONS?

- ▶ Today brings an investigation about combining and splitting two-dimensional shapes.
- ▶ What do you know about combining and splitting two-dimensional shapes?
- ▶ Talk about combining and splitting two-dimensional shapes with a friend.
- ▶ Is anyone ready to share what they are thinking about combining and splitting two-dimensional shapes?
  
- ▶ We've investigated two-dimensional shapes.
- ▶ We found that two-dimensional shapes have 2 dimensions.
- ▶ We found that the dimensions on two-dimensional shapes are up and down, front to back, or up and down, left to right, or front to back, left to right.
- ▶ We investigated lines and vertices on two-dimensional shapes.
- ▶ And we found that straight lines are sides, and curved lines are just curved lines.
- ▶ We found that 2 sides met at a vertex.
- ▶ We've investigated translating, rotating and reflecting two-dimensional shapes.
- ▶ And we've investigated making tessellating patterns by translating, rotating and reflecting two-dimensional shapes.

Select two shapes, for example a square and an equilateral triangle,



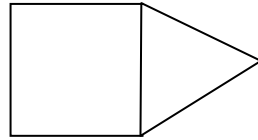
Children describe the features of the square and the triangle.

Children measure the sides with their ruler.

Children test the vertices with their [angle testers](#).

- ▶ **Today we're going to investigate combining** and splitting two-dimensional shapes to create other two-dimensional shapes.
- ▶ What are these two-dimensional shapes?
  
- ▶ Is this a square?
- ▶ How would you describe a square?
- ▶ How many sides?
- ▶ Are the sides equal?
- ▶ Could we measure the sides with our ruler?
- ▶ How many vertices?
- ▶ Are the angles in the vertices equal?
- ▶ Could we test this with our angle testers?
  
- ▶ Is this a triangle?
- ▶ How would you describe this triangle?
- ▶ How many sides?
- ▶ Are the sides equal?
- ▶ Could we measure the sides with our ruler?
- ▶ How many vertices?
- ▶ Are the angles in the vertices equal?
- ▶ Could we test this with our angle testers?
- ▶ Is this an irregular triangle?

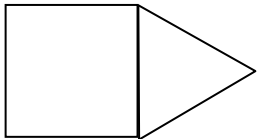
Combine the square and the triangle, for example,



Children measure the sides with their ruler.

Children test the vertices with their angle testers.

Record, for example,

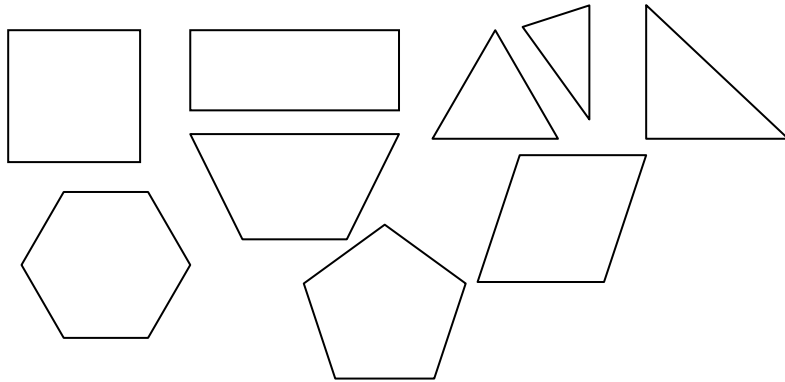


5 unequal sides, 5 unequal vertices, irregular pentagon

Children investigate combining shapes to create new shapes - [see examples](#)

- ▶ When we combine shapes, they must have 1 side joined.
- ▶ How could we combine a square and a triangle to make a new shape?
- ▶ How could we describe the new shape?
- ▶ How many sides?
- ▶ Are there 5 sides?
- ▶ How many vertices?
- ▶ Are there 5 vertices?
- ▶ What do we call a shape with 5 sides and 5 vertices?
- ▶ Is a shape with 5 sides and 5 vertices, a pentagon?
- ▶ Are the sides equal?
- ▶ Could we measure the sides with our ruler?
- ▶ Are the angles in the vertices equal?
- ▶ Could we test this with our angle testers?
- ▶ Is this pentagon regular or irregular?
- ▶ How could we record this?

Display a range of two-dimensional shapes, for example,



Select a shape, for example, a square

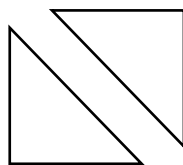


- ▶ We've investigated two-dimensional shapes.
- ▶ We found that two-dimensional shapes have 2 dimensions.
- ▶ We found that the dimensions on two-dimensional shapes are up and down, front to back, or up and down, left to right, or front to back, left to right.
- ▶ We investigated sides and vertices on two-dimensional shapes.
- ▶ And we found that straight lines are sides, and curved lines are just curved lines.
- ▶ We found that 2 sides met at a vertex.
- ▶ We've investigated translating, rotating and reflecting two-dimensional shapes.
- ▶ And we've investigated combining two-dimensional shapes to create new shapes.

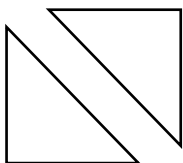
▶ **Today we're going to investigate splitting two-dimensional shapes to create new shapes.**

- ▶ How could we split some of these shapes to make other shapes?
- ▶ What shape is this?
- ▶ Is this a square?
- ▶ How would you describe a square?
- ▶ How many sides?
- ▶ Are the sides equal?
- ▶ Could we measure the sides with our ruler?
- ▶ How many vertices?
- ▶ Are the vertices equal?
- ▶ Could we test this with our angle testers?

Split the square to form 2 triangles, for example,



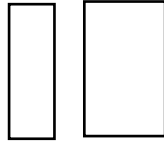
Record, for example,



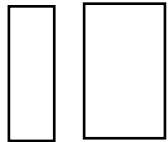
3 sides, 3 vertices, 2 equal sides, 2 triangles

- ▶ How could we split a square to make new shapes?
- ▶ How could we describe the new shapes?
- ▶ How many sides?
- ▶ Does each shape have 3 sides?
- ▶ Are the sides equal?
- ▶ Could we measure the sides with our ruler?
- ▶ How many vertices?
- ▶ Does each shape have 3 vertices?
- ▶ Are the vertices equal?
- ▶ Could we test this with our angle testers?
- ▶ Is one vertex a right angle?
- ▶ What name do we give a shape with 3 sides and 3 vertices?
- ▶ Have we created triangles?
- ▶ Are these triangles regular or irregular?
- ▶ Because these triangles have a right angle, could we call it a right-angled triangle?
- ▶ How could we record this?

Split the square in a different way to create new shapes, for example,



Record, for example,

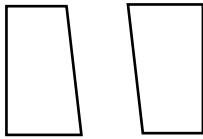


4 sides, 4 vertices, opposite sides equal and parallel, 4 vertices right angles, 2 rectangles

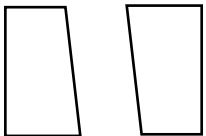
- ▶ How else could we split a square to make new shapes?
- ▶ How could we describe the new shapes?
- ▶ How many sides?
- ▶ Does each shape have 4 sides?
- ▶ Are the sides equal?
- ▶ Are any of the sides equal?
- ▶ Are opposite sides equal?
- ▶ How many vertices?
- ▶ Does each shape have 4 vertices?
- ▶ Are the vertices equal?
- ▶ Are the vertices right angles?
- ▶ What name do we give 4-sided shapes with opposite sides equal and all vertices right angles?
- ▶ Have we created rectangles?
- ▶ How could we record this?



Split the square in a different way to create new shapes, for example,



Record, for example,



4 sides, 4 vertices, 2 sides parallel,  
quadrilaterals

Children investigate splitting shapes to create new shapes -[see examples](#).

- ▶ How else could we split a square to make new shapes?
- ▶ How could we describe the new shapes?
- ▶ Does each shape have 4 sides?
- ▶ Are any of the sides equal?
- ▶ Could we measure the sides with our ruler?
- ▶ Are any of the sides parallel?
- ▶ Is one pair of opposite sides parallel?
- ▶ How many vertices?
- ▶ Does each shape have 4 vertices?
- ▶ Are any of the vertices equal?
- ▶ Could we test the vertices with our angle testers?
- ▶ What name do we give 4 sided shapes with no sides equal and 2 equal angles?
- ▶ Have we created quadrilaterals?
- ▶ How could we record this?

