

Straight Lines as Sides on 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.

STRAIGHT LINES AS SIDES ON SHAPES.

EXPLICIT TEACHING PLAN OVERVIEW PAGE

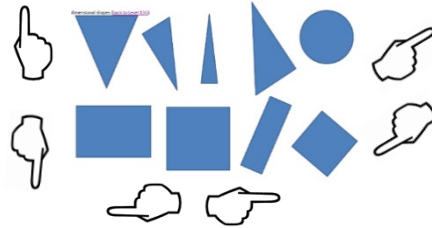
THIS PAGE IS A SUMMARY OF THE EXPLICIT TEACHING PLAN, INCLUDING STRATEGIC QUESTIONS, AND DESCRIBING THE SEQUENCE WHICH WILL OCCUR OVER MULTIPLE LESSONS.

RESOURCES: SHAPES, INCLUDING CIRCLES, TRIANGLES, QUADRILATERALS, PENTAGONS, HEXAGONS AND OCTAGONS, PENCIL, PAPER

WHAT COULD WE DO?

Children:

- Review that a shape has two of the three dimensions, up and down / left to right / front to back, side to side.



- Describe lines on shapes as straight or curved.
- Describe straight lines on shapes as sides.
- Describe curved lines on shapes as curved lines.

- Identify 2 dimensional shapes by number of sides as triangles, quadrilaterals, pentagons, hexagons and octagons.

WHAT LANGUAGE COULD WE USE TO EXPLAIN AND ASK QUESTIONS?

Children:

- ask one another questions about shapes, for example:
 - ▶ What are the 3 dimensions?
 - ▶ How many dimensions does a shape have?

 - ▶ How could we describe lines on shapes?
 - ▶ What name do we give to straight lines on shapes?
 - ▶ Where do sides meet?
 - ▶ What do we call curved lines on shapes?

 - ▶ What do we call all three-sided shapes?
 - ▶ What do we call all four-sided shapes?
 - ▶ What do we call all five-sided shapes?
 - ▶ What do we call all six-sided shapes?
 - ▶ What do we call all eight-sided shapes?

STRAIGHT LINES AS SIDES ON SHAPES.

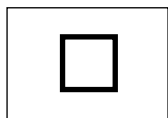
EXPLICIT TEACHING PLAN

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

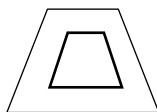
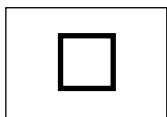
WHAT COULD WE DO?

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

Display a picture of a square, for example,



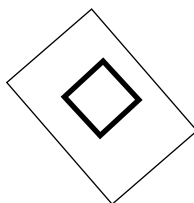
Indicate 2 of the 3 dimensions on the shapes, for example,



up and down, left to right OR left to right, front to back

Turn the square diagonally, for example,

Children may suggest the shape is now a diamond.
A diamond is not the name of a geometric shape!



WHAT LANGUAGE COULD WE USE TO EXPLAIN AND ASK QUESTIONS?

- ▶ Today brings an investigation about two-dimensional shapes.
- ▶ What do you know about shapes?
- ▶ Talk about shapes with a friend.
- ▶ Is anyone ready to share what they are thinking about shapes?

- ▶ We've investigated shapes.
- ▶ And we've investigated dimensions.
- ▶ We found that the dimensions are up and down, left to right, and front to back.
- ▶ And we found that shapes have 2 of these dimensions.

- ▶ The shape could go up and down, left to right.
- ▶ Or the shape could go left to right, front to back.

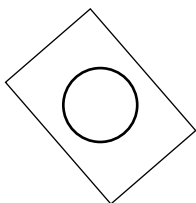
- ▶ **Today we're going to investigate lines on shapes.**
- ▶ Is this shape, a square?
- ▶ If I turn the square, like this, what shape is it now?
- ▶ Is it still a square?
- ▶ Can you see any lines on the square?

Record, for example, side.

Children count the sides.

Record, for example, 4 sides.

Display a circle drawn on a piece of paper, for example,



Record, for example, curved line.

Children count the curved lines.

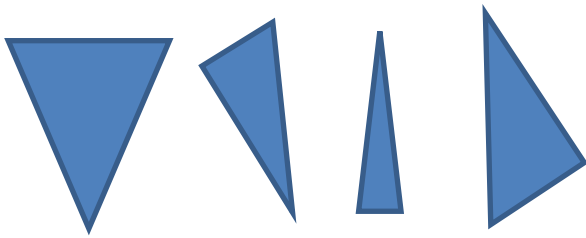
Record, for example, 1 curved line.

- ▶ How many lines?
- ▶ Are there 4 lines?
- ▶ How could we describe the lines?
- ▶ Are the lines straight or curved?
- ▶ Are the lines straight?
- ▶ When a line on a shape is straight, we call it a side.
- ▶ How many sides does a square have?
- ▶ Does a square have 4 sides?

- ▶ What shape is this?
- ▶ Is this shape, a circle?
- ▶ Can you see any lines on the circle?
- ▶ How many lines?
- ▶ Is there 1 line?
- ▶ How could we describe the line?
- ▶ Is the line straight or curved?
- ▶ Is the line curved?
- ▶ When a line on a shape is curved, we call it a curved line.
- ▶ How many curved lines does a circle have?
- ▶ Does a circle have 1 curved line?

Display some shapes, including triangles, squares and rectangles.

Children identify the triangles, for example,



Point to triangles in different orientations and sizes.

Record, for example, triangle

'Underline 'tri' in triangle, for example,

tri angle

Record '3' underneath 'tri', for example,

tri angle

3

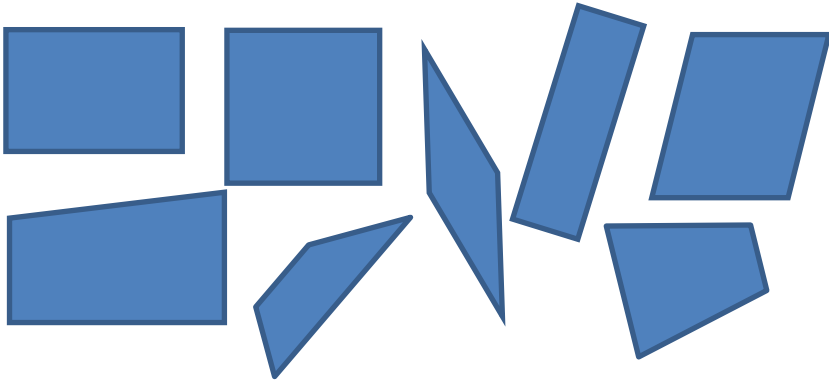
Record, for example, a triangle has 3 sides.

▶ What shapes can you see here?

- ▶ Which shapes here are triangles? How do you know?
- ▶ How many lines do triangles have?
- ▶ Do triangles have 3 lines?
- ▶ Are the lines straight or curved?
- ▶ Because the lines are straight, do we call them sides?
- ▶ How many sides do triangles have?
- ▶ Do triangles have 3 sides?
- ▶ Is this shape a triangle?
- ▶ Is this shape a triangle?
- ▶ Let's look at the word triangle.
- ▶ It's made up of 2 words in an old language called Latin – 'tri' and 'angle'.
- ▶ What number do you think 'tri' means?
- ▶ Think about a tricycle – how many wheels does a tricycle have?
- ▶ Think about a triangle – how many sides does a triangle have?
- ▶ Do you think 'tri' means 3?

- ▶ If a shape has 3 sides, is it a triangle?

Display some quadrilaterals, for example,



Record, for example, quadrilateral

'Underline 'quad' in quadrilateral and record '4' underneath, for example,

quadrilateral

Record '4' underneath 'quad', for example,

quadrilateral

4

Point to different quadrilaterals.

Point to a square, for example,



Point to a rectangle, for example,



Point to a quadrilateral that is neither a square nor a rectangle, for example,



► **What shapes can you see here?**

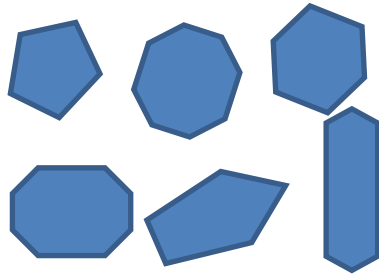
- How could we describe these shapes?
- How many lines do these shapes have?
- Do these shapes have 4 lines?
- Are the lines straight or curved?
- Because the lines are straight, do we call them sides?
- How many sides do these shapes have?
- Do these shapes all have 4 sides?
- Because these shapes have 4 sides, we call them quadrilaterals.

- Let's look at the word quadrilateral.
- It's made up of 2 words in an old language called Latin – 'quad' and 'lateral'.
- What number do you think 'quad' means?
- Think about a quad bike – how many wheels does a quad bike have?
- If a shape has 4 sides, is it a quadrilateral?
- Is this shape a quadrilateral?

- Is a square a quadrilateral?
- Is a rectangle a quadrilateral?

- If a shape has 4 sides, is it a quadrilateral?

Display some pentagons, hexagons and octagons,
for example,



Record, for example, pentagon

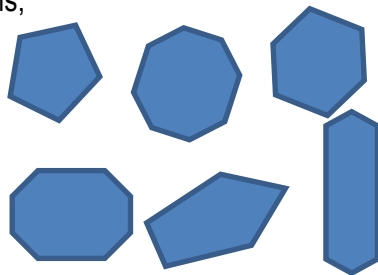
Underline 'pent' in pentagon and record '5' underneath, for example,

pentagon

5

Point to different hexagons.

Display some pentagons, hexagons and octagons,
for example,



Record, for example, hexagon

► Do any shapes have 5 sides?

► Because these shapes have 5 sides, we call them pentagons.

► Let's look at the word pentagon.

► It's made up of 2 words in an old language called Latin – 'pent' and 'agon'.

► What number do you think pent means?

► Do you think 'pent' means 5?

► Does a pentagon have 5 sides?

► Is this shape a pentagon?

► Is this shape a pentagon?

► If a shape has 5 sides, is it a pentagon?

► Do any shapes have 6 sides?

► Because these shapes have 6 sides, we call them hexagons.

► Let's look at the word hexagon.

► It's made up of 2 words in an old language called Latin – 'hex' and 'agon'.

► What number do you think hex means?

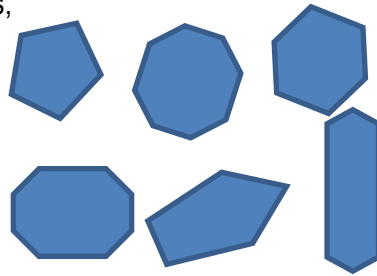
Underline 'hex' in hexagon and record '6' underneath, for example,

hexagon

6

Point to different hexagons.

Display some pentagons, hexagons and octagons, for example,



Record, for example, octagon

Underline 'oct' in octagon and record '8' underneath, for example,

octagon

8

Point to different octagons.

▶ Do you think 'hex' means 6?

▶ Does a hexagon have 6 sides?

▶ Is this shape a hexagon?

▶ Is this shape a hexagon?

▶ If a shape has 6 sides, is it a hexagon?

▶ Do any shapes have 8 sides?

▶ Because these shapes have 8 sides, we call them octagons.

▶ Let's look at the word octagon.

▶ It's made up of 2 words in an old language called Latin – 'oct' and 'agon'.

▶ What number do you think 'oct' means?

▶ Do you think 'oct' means 8?

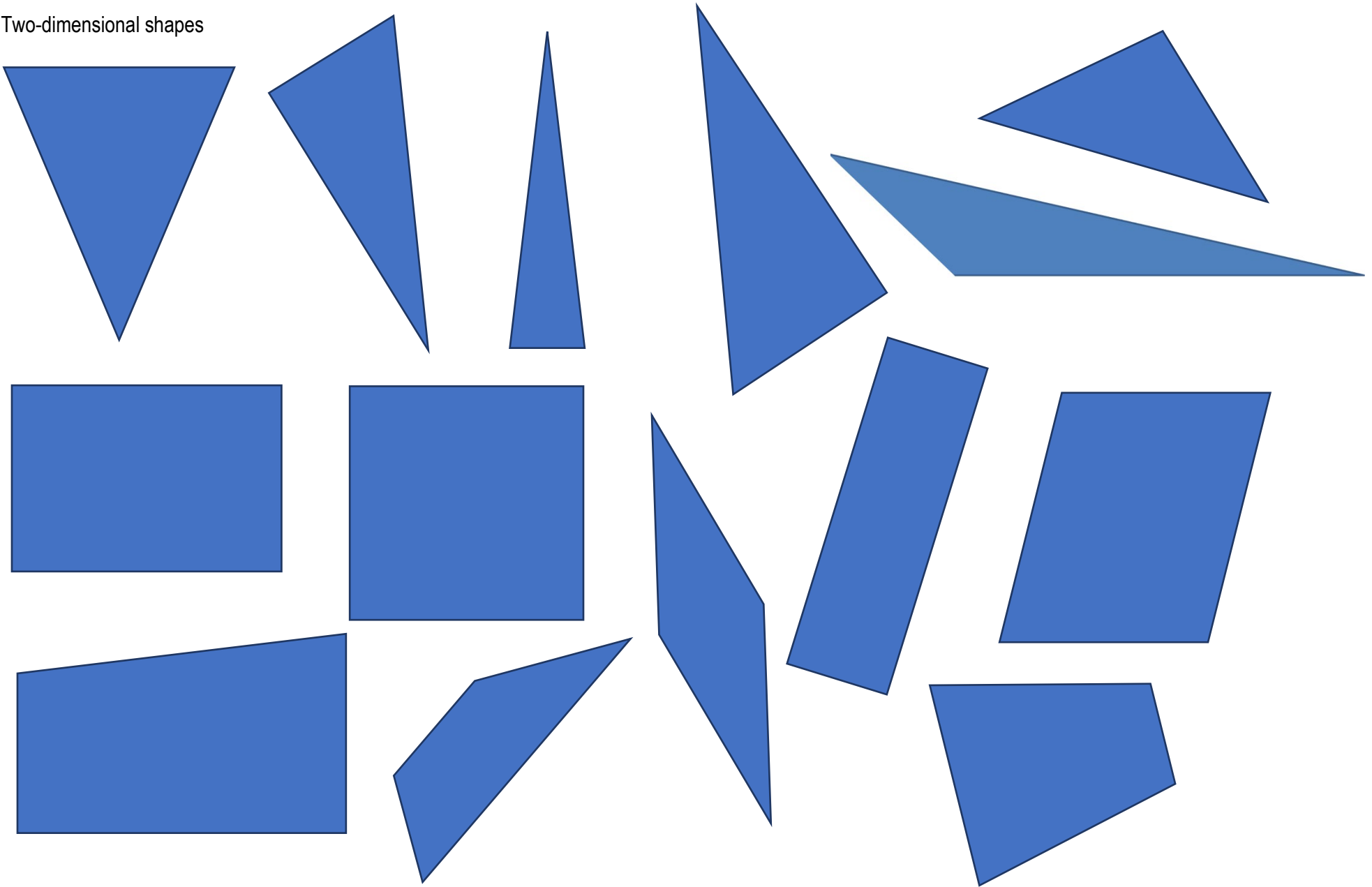
▶ Does an octagon have 8 sides?

▶ Is this shape an octagon?

▶ Is this shape an octagon?

▶ If a shape has 8 sides and 8 corners, is it a octagon?

Two-dimensional shapes



Two-dimensional shapes

