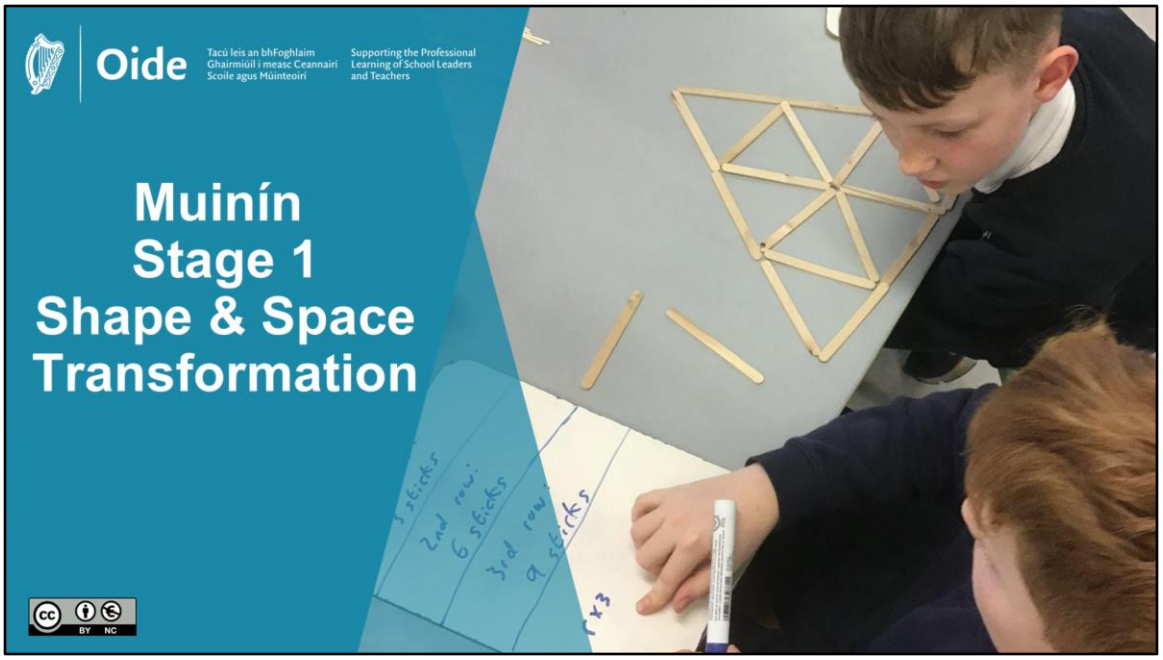
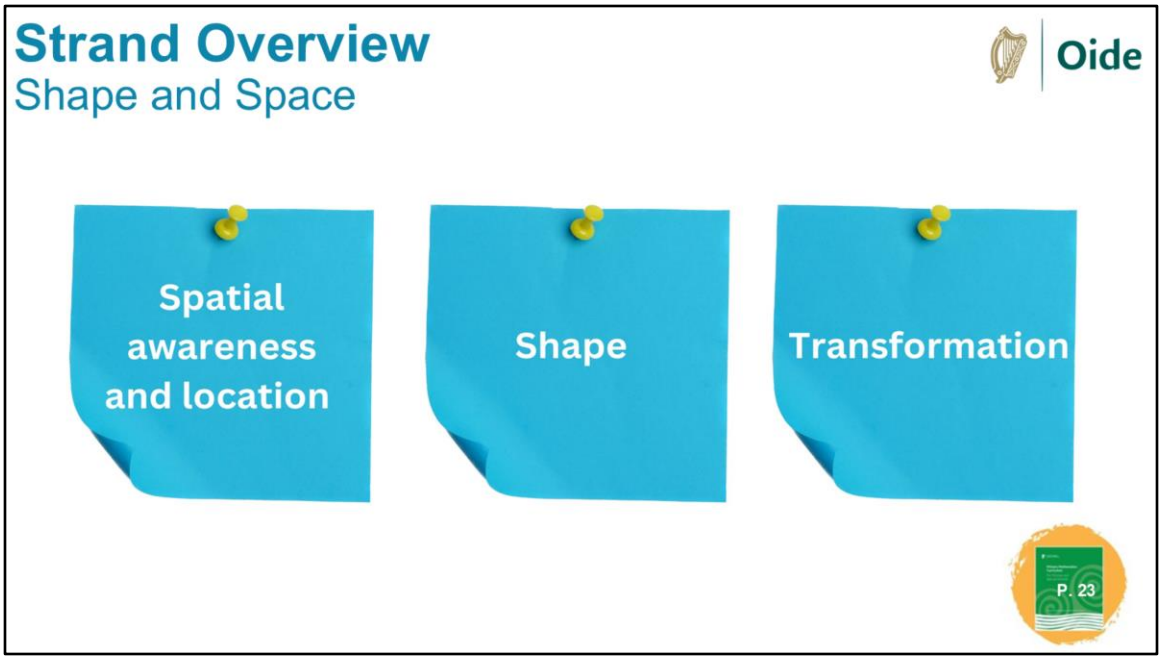
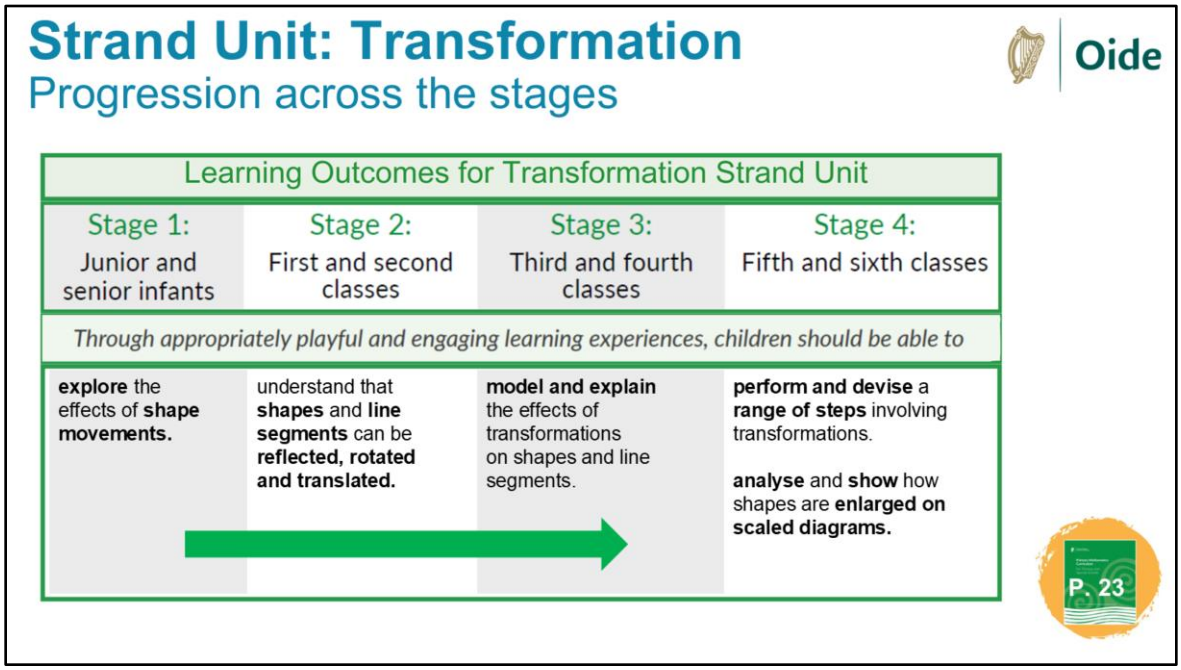


Purpose of slide:
Introductory slide for presentation of Stage 1 Shape & Space – Transformation.



Purpose of slide:
To provide an overview of the Strand of Shape and Space.

Notes for teacher:
• Go to p.23 of the curriculum document and take some time to look at the strand units of Shape and Space.
• Please note that '**Transformation'** is a new strand unit in the PMC.
• This presentation will explore the strand unit Transformation, but also aspects of the strand unit 'Shape' as they naturally complement each other.



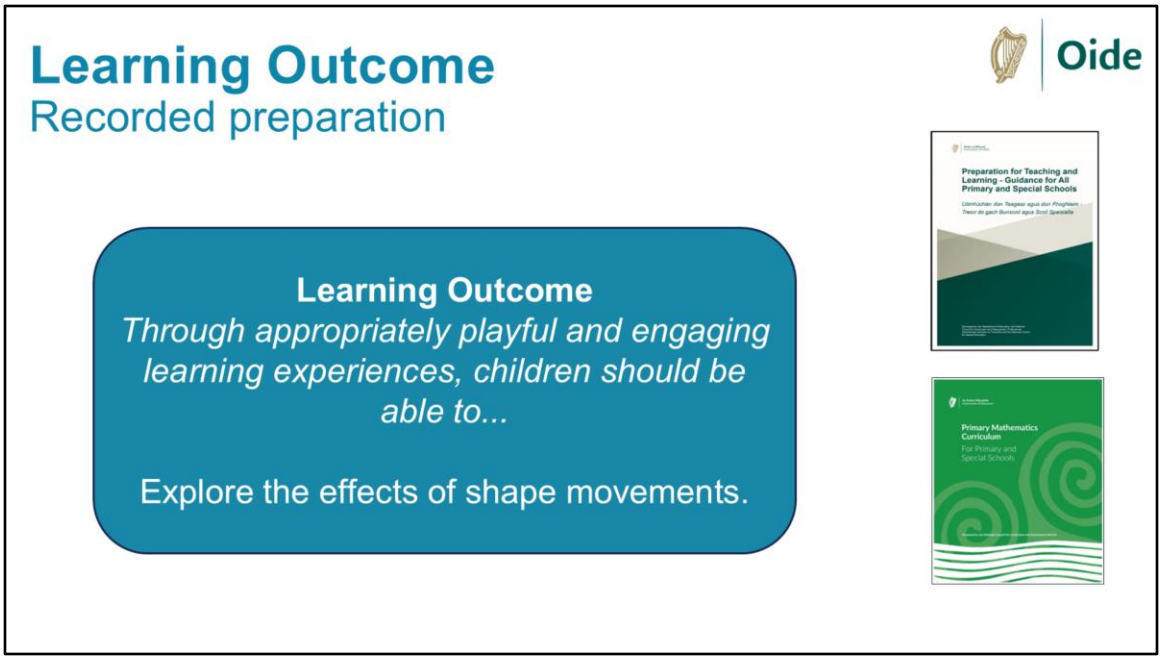
Purpose of slide:
To explore the progression across the stages in the strand unit Transformation.

Notes for teachers:

- Notice the progression along the stages.
- Note how language, knowledge and skills are developed from stages 1 to 4.
- Knowledge of progression is necessary so that we can adapt and extend our teaching based on the knowledge we have of the children in front of us.
- Looking at the learning outcomes we can see how each stage builds upon the last, fostering a rich understanding of transformation and its mathematical significance.
- In Stage 1 pupils will use **informal language** such as ***flip/turn/slide.*** This foundational stage encourages curiosity about the basic movements of shapes without formal terminology.
- In Stage 2, pupils progress to using **formal mathematical language** ***reflect/rotate/translate.*** Pupils continue to explore, learn and build knowledge about specific types of transformations—reflections, rotations, and translations. They start to recognise and differentiate these movements, deepening their understanding of how shapes can change position and

orientation.

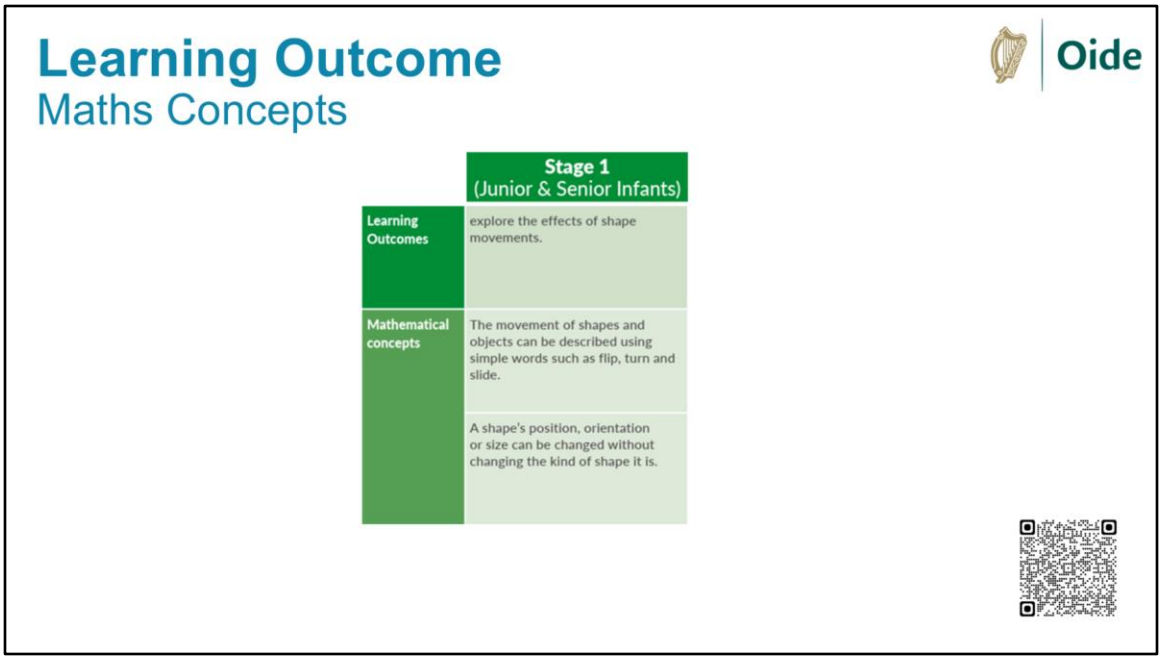
- In Stage 3, pupils **model transformations and explain their effects on shapes and line segments**. They begin to articulate their understanding, using appropriate terminology to describe how transformations alter the shapes' positions and properties.
- In Stage 4, pupils not only perform various transformations but also **creatively devise their own sequences of steps** involving these movements. They analyse how shapes can be enlarged or reduced in scaled diagrams, integrating their knowledge of transformations into more complex scenarios.
- Each stage builds upon the last, fostering a comprehensive understanding of geometric transformations.
- Summary:
    - (Stage 1) Exploration of movements leads to
    - (Stage 2) understanding transformations which evolves into
    - (Stage 3) the ability to model and explain those transformations
    - (Stage 4) where pupils perform and create transformations, applying their knowledge.



Purpose of slide:
To highlight the learning outcome as the starting point for preparation for teaching & learning.

Notes for teachers:

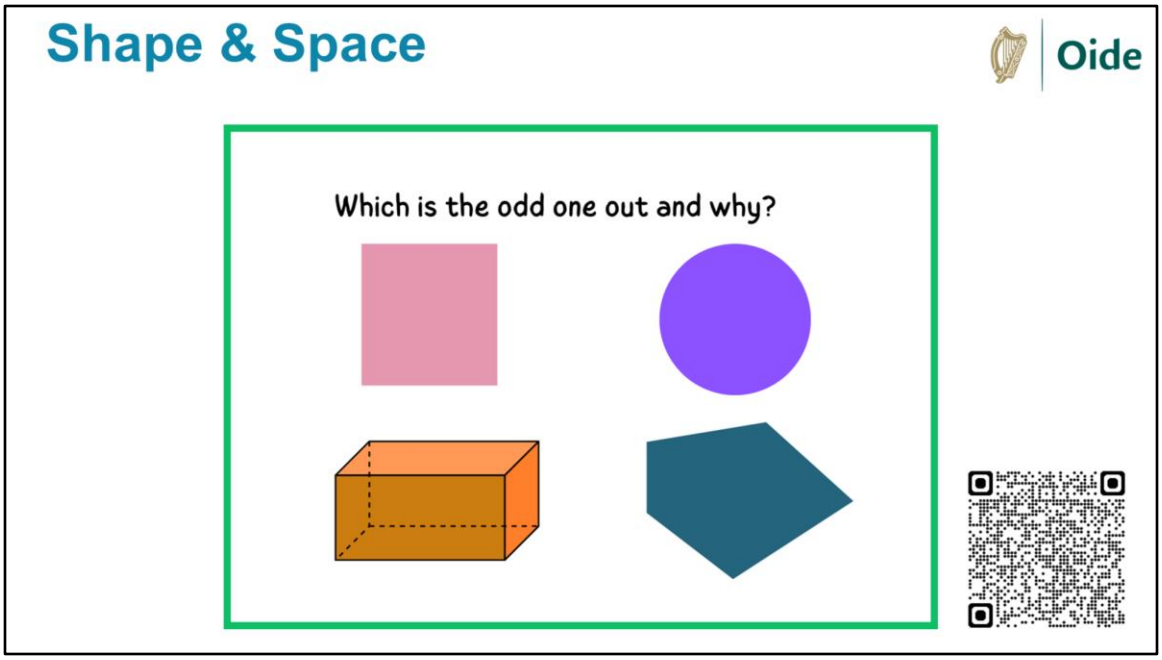
- This is the learning outcome for Stage 1 Shape and Space Transformation.
- Learning outcomes are broad in nature. They are the big mathematical ideas that the child is working towards over a 2-year period.
- When working with learning outcomes it is useful to break down the learning outcome into areas of focus. See Concepts on next slide.
- For Stage 1 Transformation the pupils will be exploring the effects of shape movements i.e. what happens to a shape when it slides/ flips/ turns?



Purpose of slide:
To highlight the Maths Concepts which underpin the learning outcome for Stage 1 Transformation.

Notes for teachers:

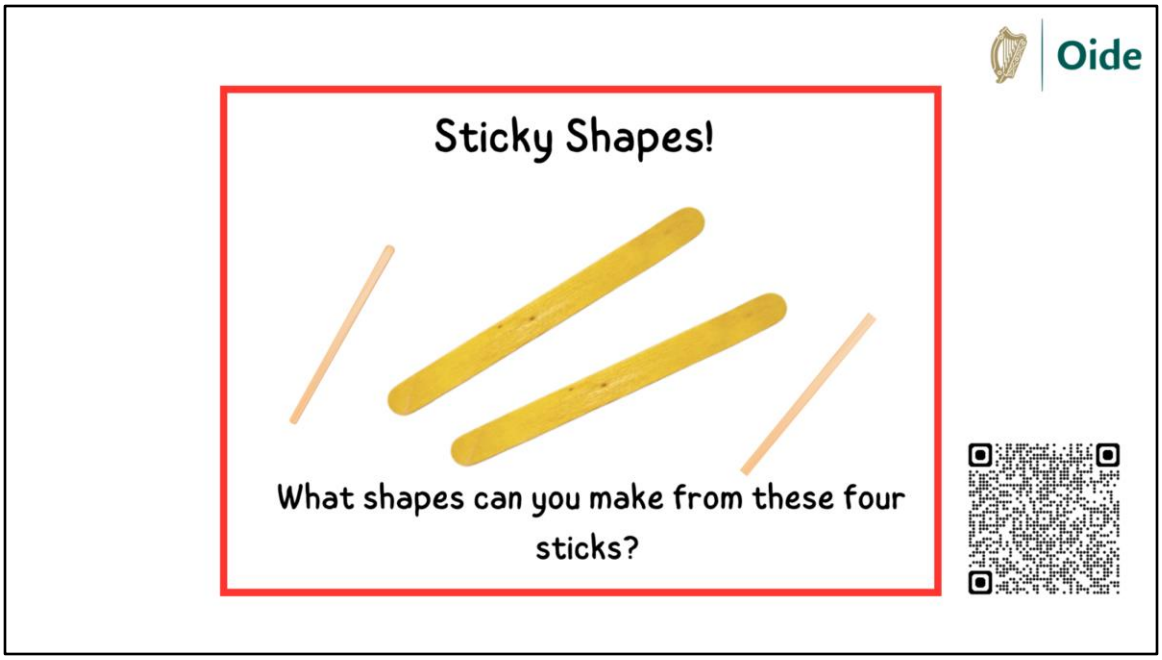
- The Maths Concepts are the key mathematical ideas that underpin each learning outcome.
- The Maths Concepts may be useful in identifying a Focus of New learning when preparing for teaching and learning.
- Take a few moments to explore the Learning Outcomes and the Maths Concepts on the NCCA Maths Toolkit by using the QR code above.



Purpose of slide:
To engage pupils in a warm-up activity that highlights the language of shape.

Notes for teachers:
- This problem explores some basic properties of shapes.
- There are multiple solutions to the question. There is no right or wrong answers as long as pupils **argue** their logic.
- This activity provides a great opportunity for Maths Talk in a low stakes, playful way.

Resources required:
Use the QR code on the slide to find more examples of Odd One Out tasks in the Micromaths section of https://pmc.oide.ie/resources/micro-maths/



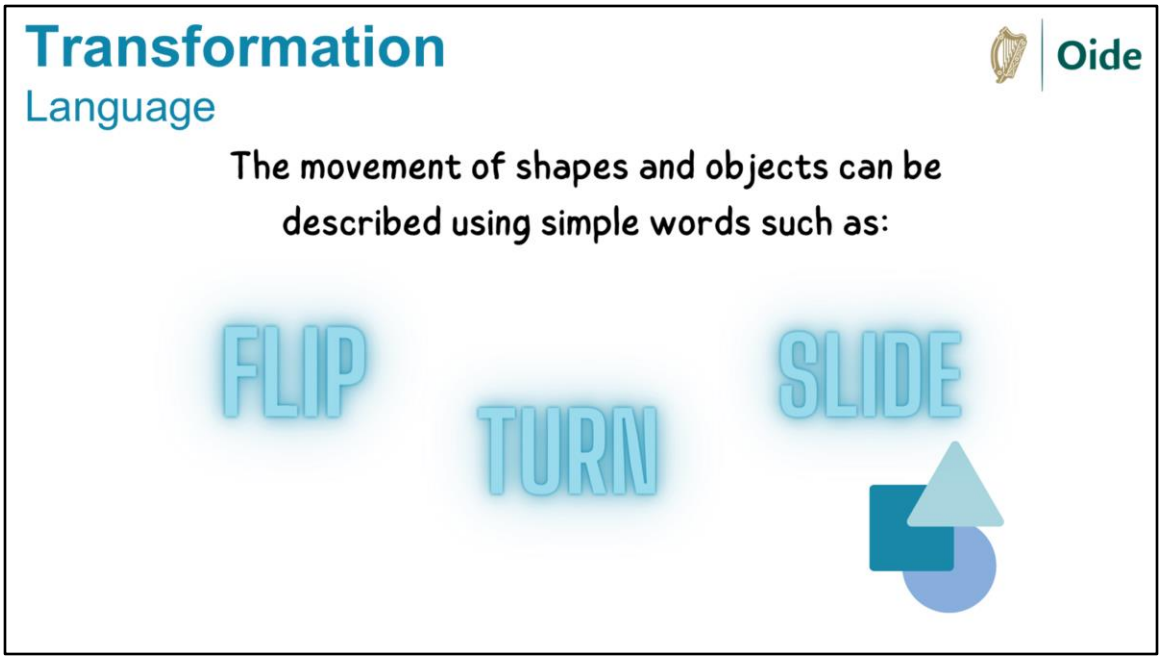
Purpose of slide:
To demonstrate an activity where pupils:

1. create their own shapes using 4 sticks.
2. discover that, regardless of how a shape is transformed, it remains the same shape.

Notes for teachers:

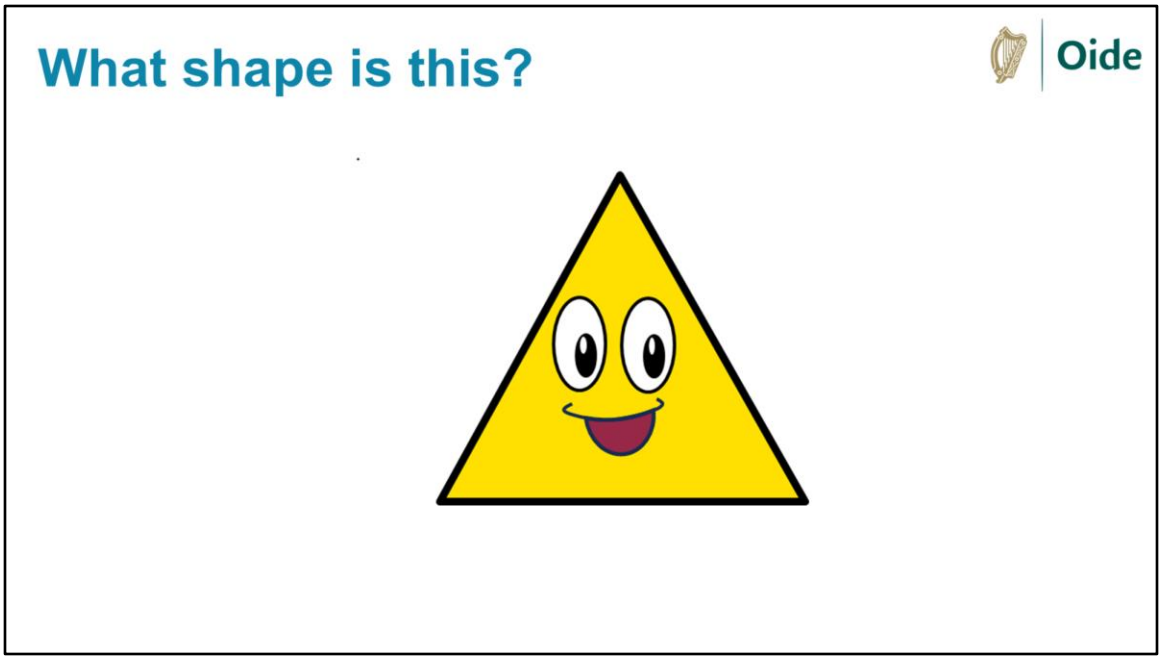
- This activity links with both the strand units of SHAPE and TRANSFORMATION.
- Pupils experiment with moving the sticks to create different shapes.
- Ask the following questions:
  - *Can you name your shape?*
  - *How many different shapes can you make?*
- Transformation Questions:
  - *What happens if you slide your shape? Does it change or stay the same?*
  - *What happens if you turn your shape? Does it change or stay the same?*
  - *What happens if you flip your shape? Does it change or stay the*

same?
    - *Can you record your shapes in your copy/ journal?*
- Notice how this activity can be used to encourage the development of mathematical language about shapes.
- Use the QR code on the slide to find this open ended task and more examples in the Micromaths section of https://pmc.oide.ie/resources/micro-maths/



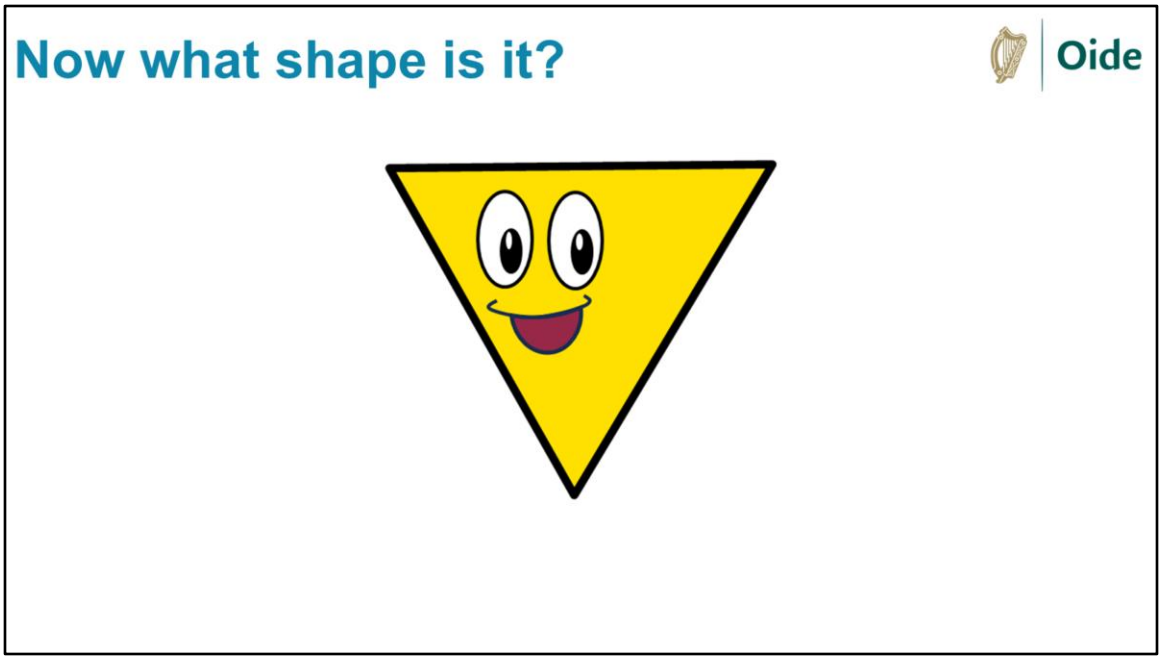
Purpose of slide:
To introduce the language of transformation at Stage 1.

Notes for teachers:
- The language of **FLIP, TURN, SLIDE** sets the foundation for using more complex language of **reflect, rotate and translate** from stage 2 onwards.
- Pupils can become familiar with this language by using body movement to flip, turn and slide before moving on to the transformation of concrete materials.
- There will be opportunities to use this terminology in other subject areas. Some examples include:
    - PE- cup and saucer game with cones; orienteering.
    - Art-symmetry.
    - Geography- directions.



Purpose of slide:
To demonstrate that when a shape is moved, it remains the same shape.

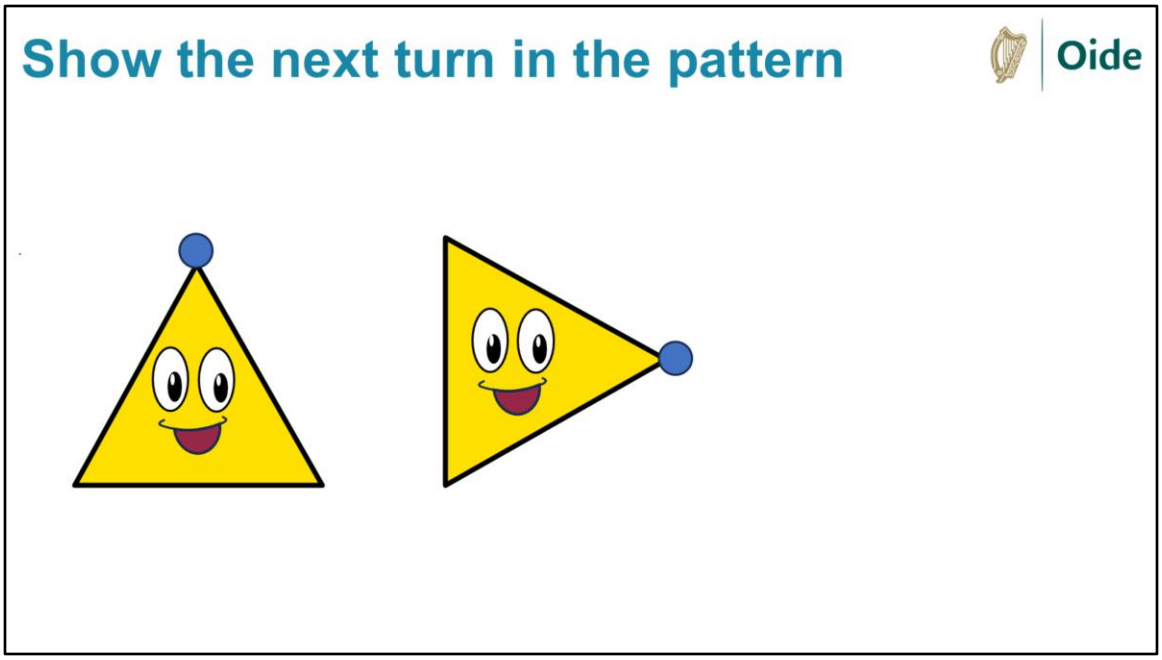
Notes for teachers:
- Ask pupils to state the shape they see on the screen.
- Look at the next slide. This could be used to ask them what shape do they see now?



Purpose of slide:
To demonstrate that when a shape is moved, it remains the same shape.

Notes for teachers

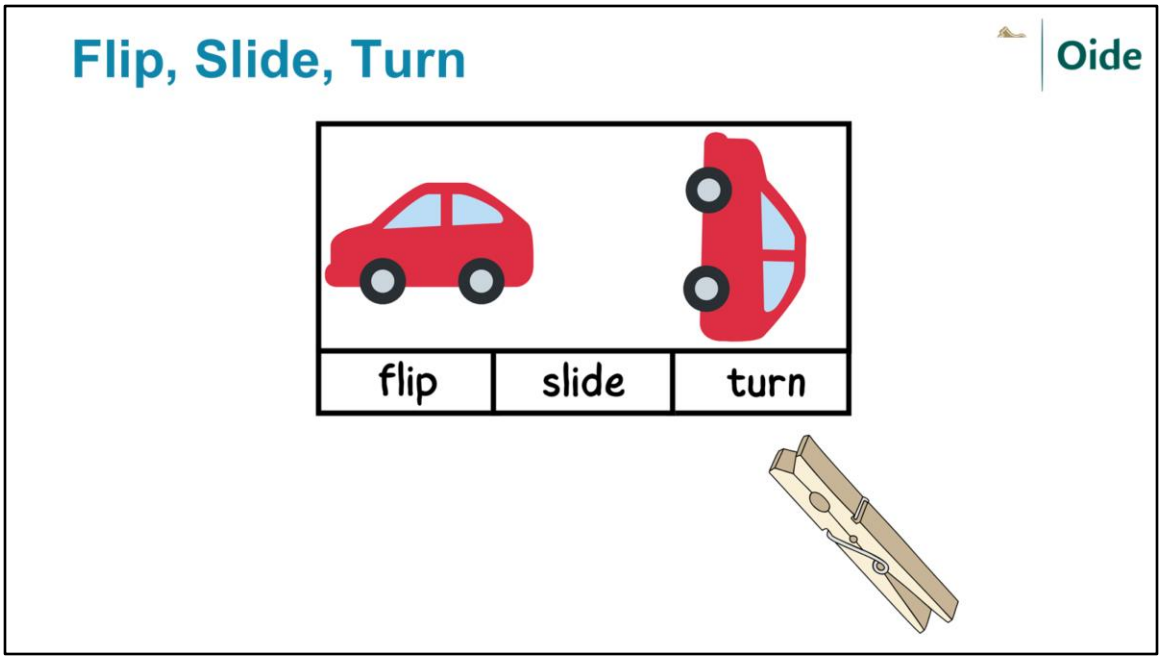
- Many stage one pupils might refer to this as ‘an upside down triangle.’
- Just because it has been turned/ rotated does not mean that it has changed shape.
- It remains a triangle!



Purpose of slide:
To demonstrate that when a shape is moved, it remains the same shape.

Notes for teachers:

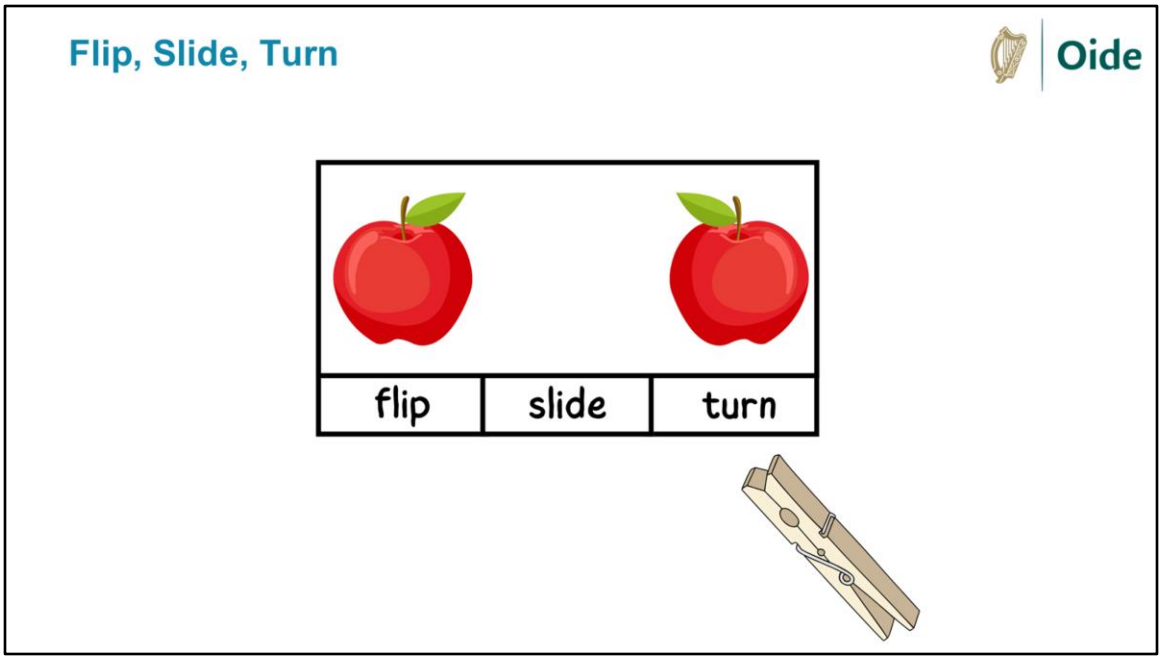
- When visualising the turning (rotation) of a shape, it may be useful for pupils to focus on a part of the shape to help them see the next rotation.
- The dot on one of the points of the above triangle can help pupils see the next turn in the pattern.
- The more hands-on experience pupils have of flipping, turning and sliding shapes, the more efficient they become at visualising shape transformation.
- Activities like this help pupils get better at imagining (visualising) how shapes can change or move, which is an important part of learning maths. It supports their understanding of geometry and builds skills they'll use in other areas too. Over time, pupils learn they don't always need to physically move things to see what will happen—they can picture it in their heads and trust their thinking.



Purpose of slide:
To highlight the language of shape transformation through a suggested stage 1 activity.

Notes for teachers:

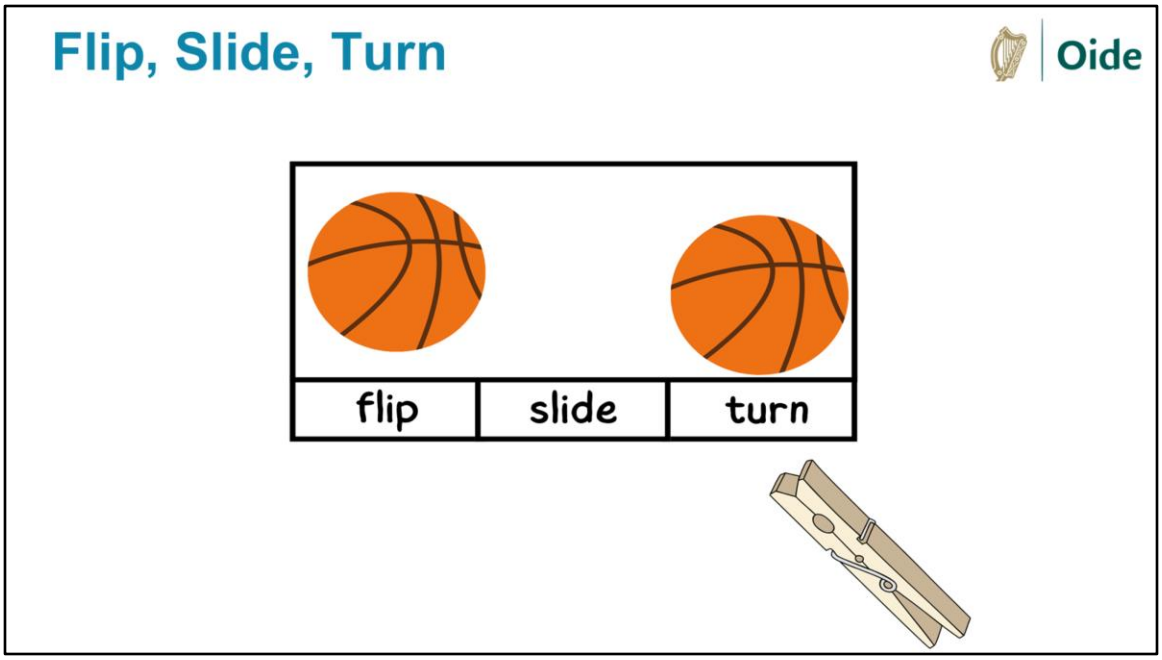
- In this activity, pupils communicate their understanding of shape movement.
- Pupils will have become familiar with the language of transformation through body movement and use of concrete resources prior to an activity such as this. This can help pupils to distinguish between the terms flip and turn as sometimes they can be used interchangeably e.g. flip a pancake (turning it OVER), turn the wheel of the toy car.
- Pupils could verbally state what has happened to the car e.g. the car has turned.
- Another idea is that older stage 1 pupils could demonstrate their understanding by using a peg to select the shape movement that has occurred.
- Think about other ways to extend or adapt these activities for the pupils in your class.



Purpose of slide:
To highlight the language of shape transformation through a suggested stage 1 activity.

Notes for teachers:

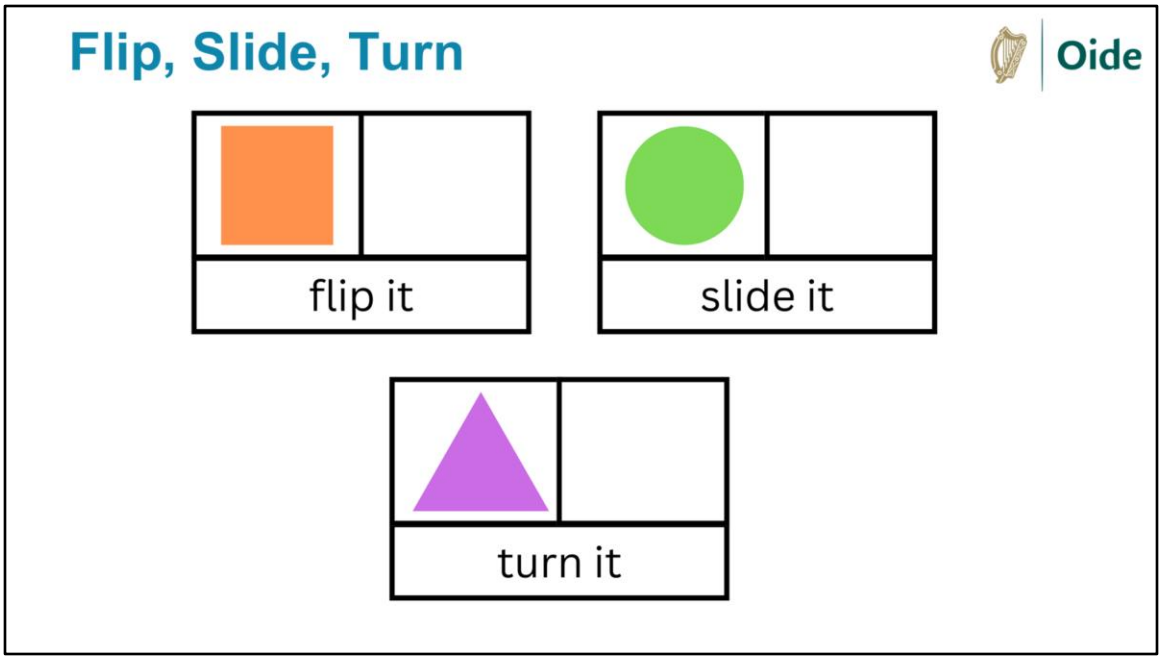
- In this activity, pupils communicate their understanding of shape movement.
- Pupils will have become familiar with the language of transformation through body movement and use of concrete resources prior to an activity such as this.
- Pupils could verbally state what has happened to the apple e.g. the apple has flipped.
- Another idea is that older stage 1 pupils could demonstrate their understanding by using a peg to select the shape movement that has occurred.
- Think about other ways to extend or adapt these activities for the pupils in your class.



Purpose of slide:
To highlight the language of shape transformation through a suggested stage 1 activity

Notes for teachers:

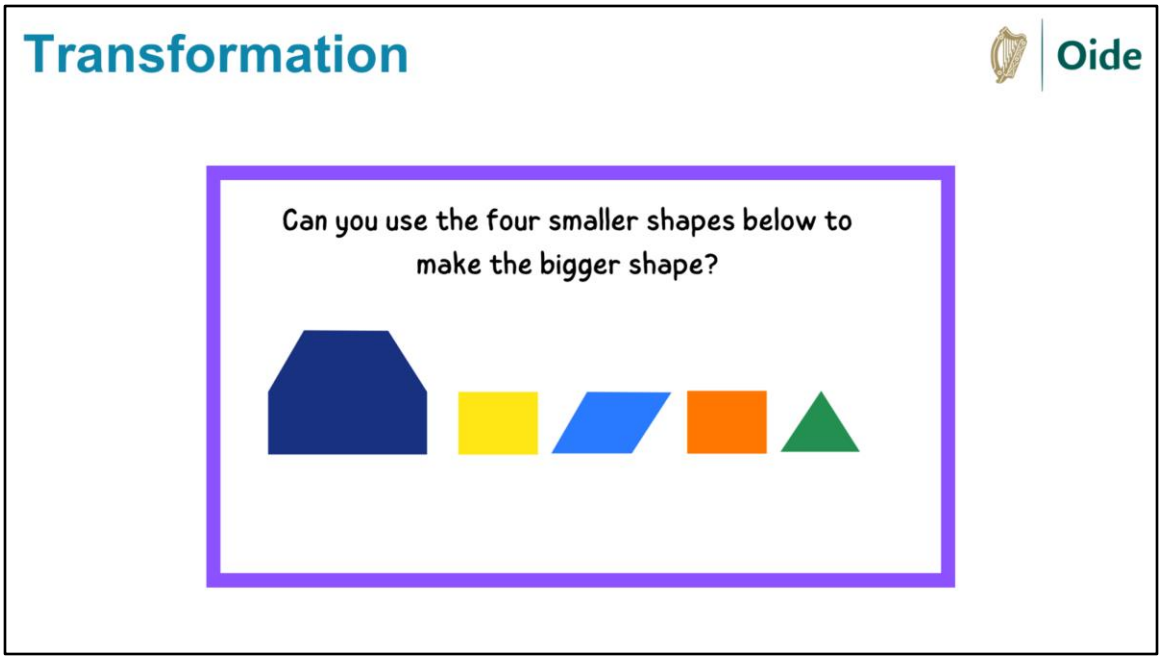
- In this activity, pupils communicate their understanding of shape movement.
- Pupils will have become familiar with the language of transformation through body movement and use of concrete resources prior to an activity such as this.
- Pupils could verbally state what has happened to the apple e.g. ball has slid.
- Another idea is that older stage 1 pupils could demonstrate their understanding by using a peg to select the shape movement that has occurred.
- Think about other ways to extend or adapt these activities for the pupils in your class.



Purpose of slide:
To demonstrate an extension activity to further develop the concept of shape transformation

Notes for teachers:

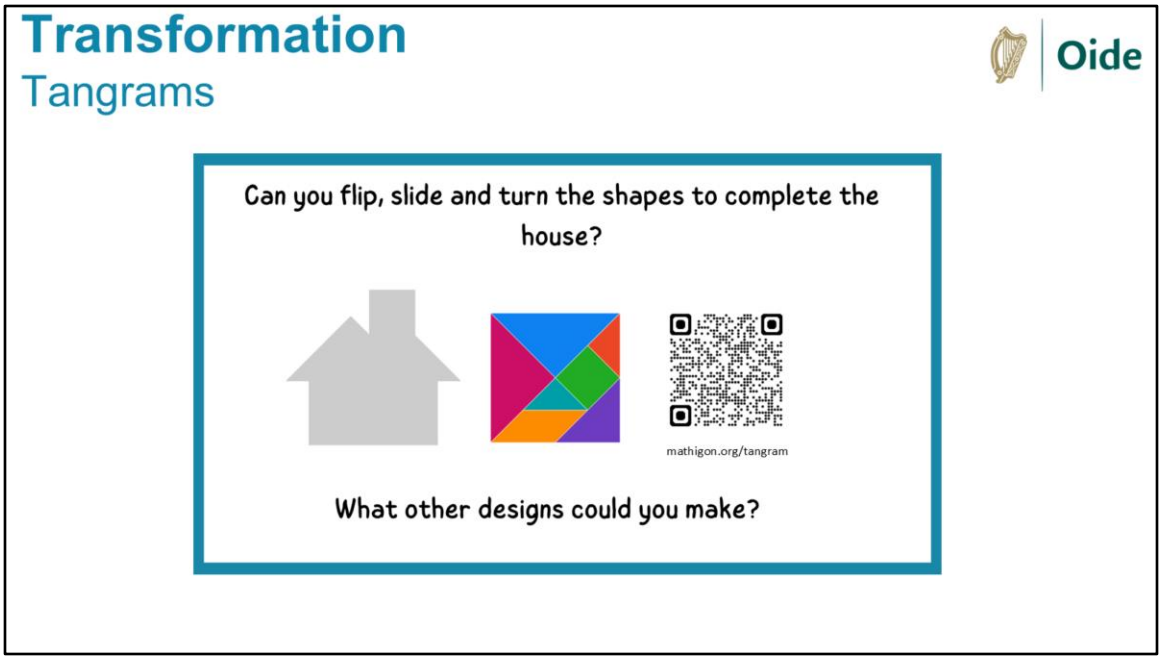
- This is a variation of the previous activity.
- Instead of placing the peg on the correct shape movement, the pupils move the image/ shape themselves to demonstrate their understanding.
- Think about ways to extend or adapt these activities for the pupils in your class.



Purpose of slide:
To show a task that promotes progression in transforming shapes to create other shapes.

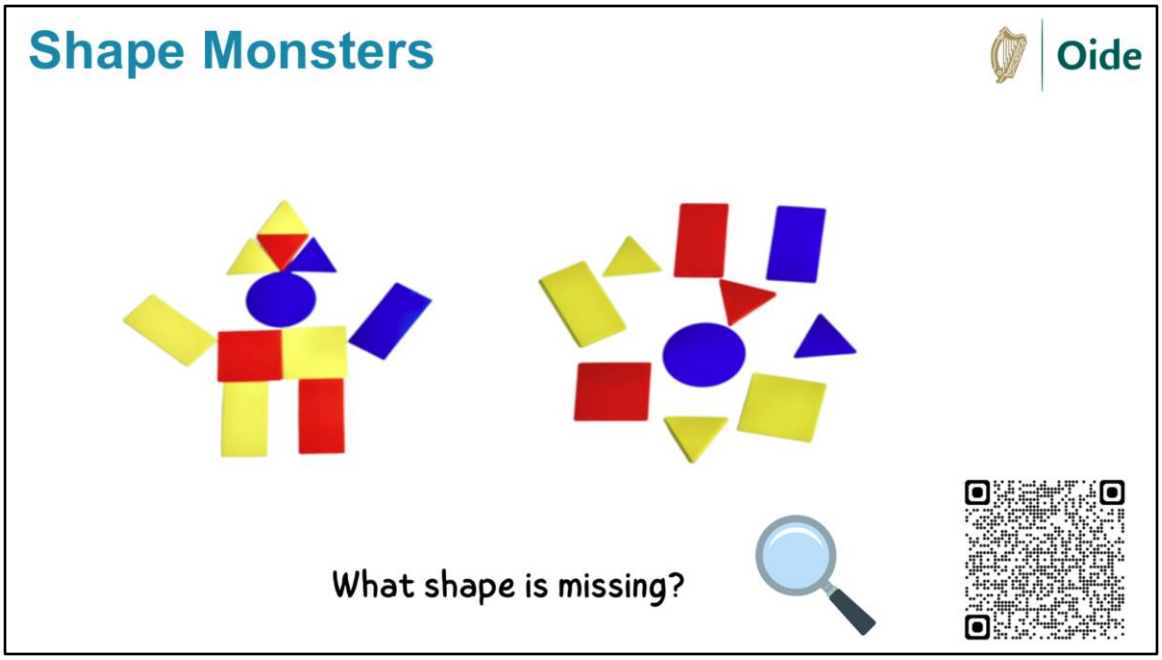
Notes for teachers:

- This is an entry point into using tangrams. In this case the student uses only 4 pieces out of the 7.
- An extension of this might be to take away the outline and then create the shape again.
- Activities like this help pupils get better at imagining (visualising) how shapes can change or move, which is an important part of learning maths. It supports their understanding of geometry and builds skills they'll use in other areas too. Over time, pupils learn they don't always need to physically move things to see what will happen—they can picture it in their heads and trust their thinking.



Purpose of slide:
To demonstrate a tangram activity using virtual manipulatives to reinforce the language and visualization of shape transformation.

Notes for teachers:
- For this activity the student moves shapes for a purpose.
- This activity can be adapted and/or extended to support or challenge pupils.
- The house template is for demonstration purposes and to show the features of Amplify Polypad. There are many other templates available.
- Development of language of transformation e.g.
    - Will it fit if I turn it this way?
    - Will it match if I flip it over?
    - Can I slide it into place?
- How can you see this working in your class?
- Use the QR code to try out this tangram activity on Amplify Polypad.



Purpose of slide:
To demonstrate an activity using concrete resources that encourages the use of the language of shape.

Notes for teachers:

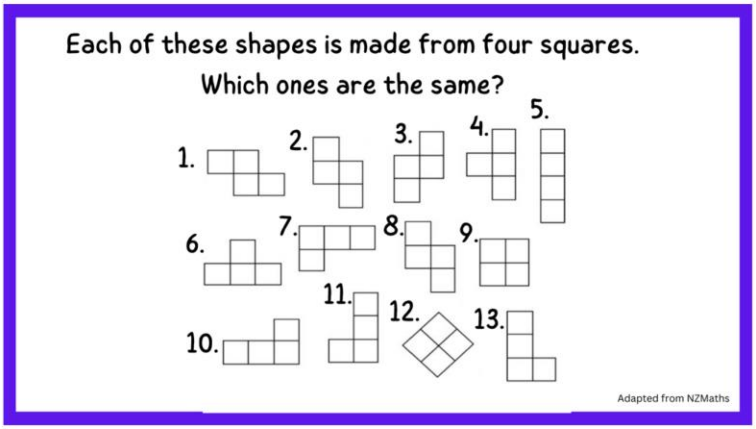
- This activity is a like deconstructed tangrams task.
- Pupils who have a **lot of experience using tangrams** may find it easier to visualise the missing shape (**the yellow rectangle).**
- This task provides many opportunities for maths talk using the language of ‘shape’, ‘colour’, ‘size’, ‘turn’, ‘flip’, ‘slide’ (transformation).
- Teacher could display on a board for class discussion.
- Encourage the pupils to think about what helped them find the missing piece? What was their strategy?

Alternatively:

- Pupils could create their own shape monster, take a picture on a device, deconstruct their monster and remove a shape and challenge their partner to discover the missing shape, using the picture as guide again encouraging them to strategise.
- Use the QR code on the slide to find this task on the Micromaths section of https://pmc.oide.ie/resources/micro-maths/

Transformation

Quadrominos Matching



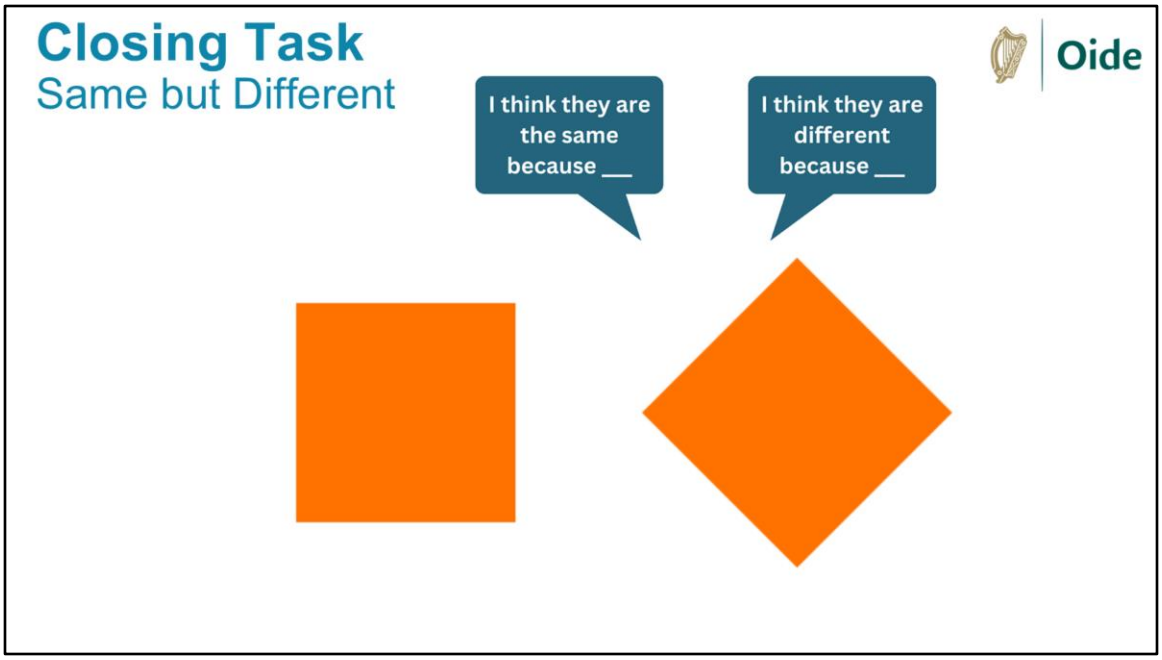
Purpose of slide:
Recognising shapes under transformation.

Notes for teachers:

- This activity may appear challenging for stage 1 pupils, but the more experience they have of transforming shapes using flip, slide, turn, then the more able they will be to visualize the transformations in an activity like this.
- Possible approach:
  - Introduce the problem.
  - Discuss in pairs or small groups:
    - *How have shapes been made?* (four squares with meeting sides are important criteria).
    - *What do you need to do to solve the problem?*
  - Plan approach (Encourage the pupils to predict which quadrominos have been transformed).
  - For consideration:
    - *Can they match the ones that are the same using the language of transformation-flip, slide and turn?*
    - *Can they find the odd one out?*

    - *Can they convince themselves and others that they have solved the problem?*
- This activity could be adapted where less quadrominos are given.
- This activity could be adapted by enlarging the quadrominos.
- Pupils can be offered scissors to cut out and ‘check’ their predictions.

Resources required:
Use the QR code on the slide to find this task on the micro-maths section of https://pmc.oide.ie/resources/micro-maths/



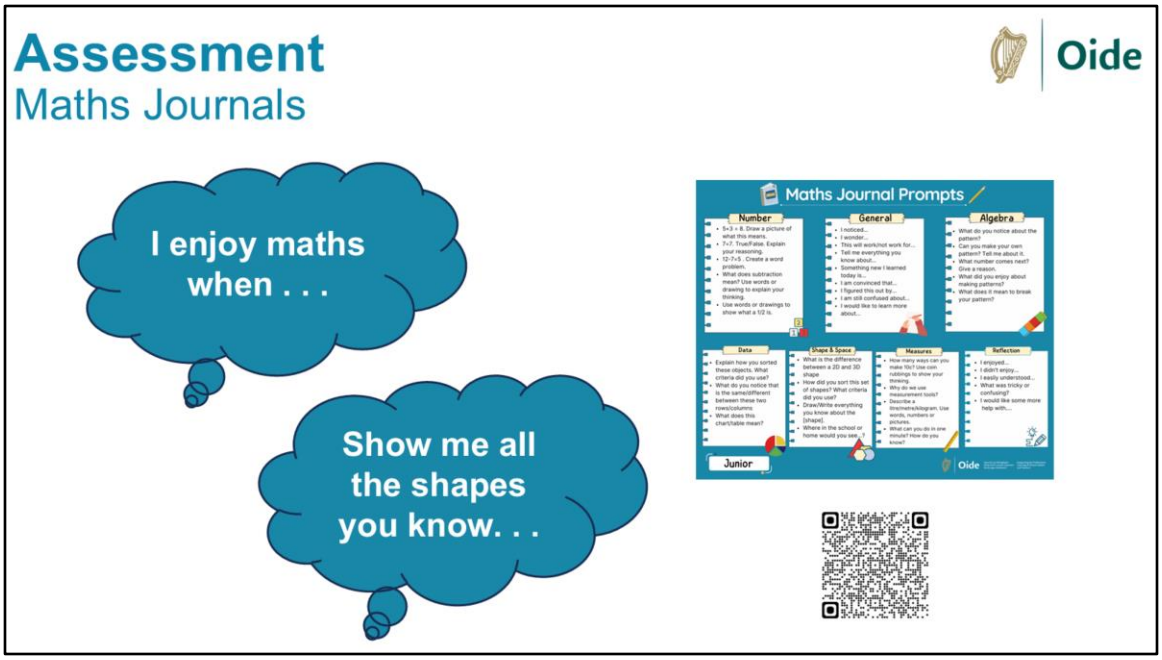
Purpose of slide:
To engage in an open-ended task that recaps on the language of shape transformation.

Notes for teachers:

- Same But Different activities are suitable for all stage groups.
- By encouraging all learners to ‘have a go’ and ‘valuing all contributions’, they develop the skills of reasoning and communicating.
- There is no right or wrong answer as long as the pupil can justify their response.
- The sentence stems can be pre-taught.
- Possible answers:
    - Both are orange.
    - Both have 4 sides.
    - Both have 4 corners.
    - Same number of angles.
    - Length of lines are the same.
    - One is facing forward; one is turned on its side or flipped.
    - **One looks like a square; one looks like a diamond (diamond is

not a precise mathematical term. It’s often used to describe a rhombus that’s tilted or rotated. In maths, we usually call it a rhombus).

- Note:
  Square = Special rhombus with right angles.
  Rhombus = All sides equal, but angles can vary.
  Diamond = Everyday word for a rhombus, especially when it's turned.



Purpose of slide:
To provide reflective prompts to use in class.

Notes for teachers:

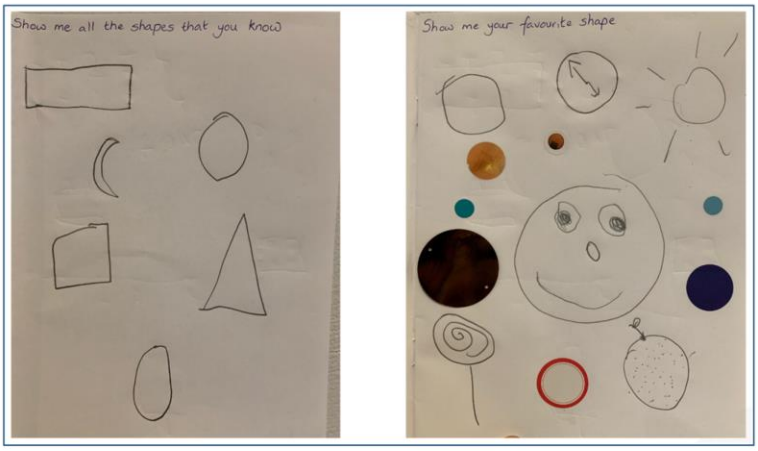
- Journals are useful for both teachers and learners to assess attitudes, knowledge and skills.
- Children can keep track of their thinking and understanding in the journal.
- Journals can contain general observations about Maths or can be more specific and focus on a particular concept.
- On the slide are two journal prompts which can be used in class. The first one focuses on the child's disposition and can be used across all strand units.
- Journal prompts:
    - I OBSERVED, I DISCOVERED, I CHECKED, I PROVED…
    - Today I enjoyed… general prompt to get the children thinking about maths and the areas that they are curious about.
    - Specific strand-based prompts….Draw your favourite shape. Where might you see it all around you? Use words or drawings

to explain your thinking. (See example on next slide)

- Use the QR Code on the slide to find the above journal prompts on the PMC Hub.

Assessment
Maths Journals

Oide



Purpose of slide:
To demonstrate a sample stage 1 maths journal for the strand of Shape.