

GEOMETRY AND MEASURE

Prerequisite learning:

- Compare and classify geometric shapes based on their properties (YEAR 5).
- Illustrate and name parts of circles (YEAR 6)
- Collecting like terms (YEAR 7 AUT1)

All video clip references
belong to  [hegartymaths](https://www.hegartymaths.com)
www.hegartymaths.com

YEAR 7 AUT2 Perimeter

Units of
measure.  **691**

Names and
properties of
shapes.  **822**

Perimeter of
rectangles.  **548-550**

Perimeter of
rectilinear shapes.  **548-550**

Problem solving with
rectangle perimeter.  **551,552**

 **534** Circumference of
circles.

Problem solving with rectilinear
shapes and perimeter.

 **551,552**

Next steps:

- Area of rectilinear shapes (YEAR 7 SPR1)
- Area of triangles, parallelograms, trapeziums and kites (YEAR 7 SPR1)

Problem solving circles
and perimeter.  **535-537**

Prerequisite learning:

- Name and classify 2D shapes. (YEAR 2)
- Find perimeter of shapes including circles (YEAR 5/6)
- Factors, Multiples and primes (YEAR7 AUT1)
- Substitution into expressions (YEAR 7 AUT1)

All video clip references
belong to  hegartymaths
www.hegartymaths.com

YEAR 7 SPR2 Area and Perimeter

Area of a
parallelogram  556

Area of rectilinear
shapes.  555

Area of rectangles.  554

Area of a
triangle.  557

Area of trapeziums.  559

Area of a
kite.  557

Problem solving
with area.  554-559

Next steps: YEAR 8 SUM2

- 3D shapes and their properties
- Surface area and volume of 3D shapes.

Prerequisite learning:

- Understand simple properties of 2D shapes (YEAR 4).
- Understand simple properties of 3D shapes (YEAR 5/6)

All video clip references
belong to  hegartymaths
www.hegartymaths.com

YEAR 7 SPR 2 Properties of 2D shapes



668

Parallel – what
does it mean?
Parallel lines.

Estimating
angles.



457

Reflection and lines
of symmetry.



639-641



What is an angle?
Measuring angles.

458-460



Rotation and order
of symmetry.

648-649

Properties of shapes –
using symbols and letters
to describe.



822-826



Properties of regular
shapes and circles.



822

Next steps: YEAR 7 SU1

- Understand the angle properties of shapes .
- Find missing angles using angle properties.

Prerequisite learning:

- Understand what an angle is (YEAR 5)
- Be able to measure and estimate angles (YEAR 5)
- Know different types of angles (YEAR 5)

All video clip references
belong to  hegartymaths
www.hegartymaths.com

YEAR 7 SU1 Angle Properties



Next steps: YEAR 7 SU2

- Understand angle properties involving parallel lines
- Use the rule for vertically opposite angles.

Prerequisite learning:

- Identify horizontal, vertical, parallel and perpendicular lines (YEAR 3)
- Know and use angle properties around a point and on a line (YEAR 5).
- Understand the sum of angles in polygons (YEAR 7 SU1)

All video clip references
belong to  hegartymaths
www.hegartymaths.com

YEAR 7 SU 2 Parallel lines and angles

Vertically
opposite angles.



480

Understand parallel,
perpendicular and
intersecting lines.



668

Corresponding
angles.



483

Alternate
angles.



481

Co-interior
angles.



482

Further problems involving angles and
parallel lines.



488-491

Next steps: YEAR 8 SU2

- Use angle properties to recognize congruent shapes
(Understand the angle properties of similar shapes.)


Prerequisite learning:

- Describe positions on a coordinate grid (YEAR 4)
- Draw and translate simple shapes on the coordinate plane (YEAR 6).

All video clip references
belong to  hegartymaths
www.hegartymaths.com

YEAR 8 SPR1 Co-ordinates and transformations

Reflections using axes as
lines of symmetry and
equations of vertical and
horizontal lines.

 **205, 639**

Using co-ordinates
to solve problems.

 **199**


Plot and read
co-ordinates.

 **199**

Describing
reflections.

 **650**


Rotations on a
co-ordinate grid.

 **648-650**

Describing
rotations.

 **650**

Translations.

 **637-638**

Combined
transformations.

 **650-657**

Next steps:

- Constructions and Loci (YEAR 8 SU2)
- Solving problems with (YEAR 10 Route A)


Prerequisite learning:

- Area of rectangles, triangles and trapeziums (YEAR 5/6).
- Understanding of units for area (YEAR 6)
- Problem solving with area to find lengths (YEAR 7 SPR2)

All video clip references belong to  **hegartymaths**
www.hegartymaths.com

YEAR 8 SPR1/2 Circles compound area

Know and use the formula for the circumference of a circle.

 **534-538**



592 Identify all key parts of a circle.

Know and use the formula for the area of a parallelogram.

 **556**

Derive and use the formula for the area of a circle.



539-543


Work backwards to find radius and diameter.

 **535,540**

Solve problems involving the area of circles.

539-543

Areas of compound shapes made of circles.

 **541-543**

Calculate arc length and sector area of fractions of circles.

 **544-547**

Next steps:

- Find volume of prisms (YEAR 8 SPR1).
- Arc length and sector area with harder angles (YEAR 10 Route B, 11 ROUTE A).

Prerequisite learning:

- Identify all key parts of a circle (YEAR 6)
- Area of simple shapes (YEAR 5)
- Perimeter of simple shapes (YEAR 7 AUT 2)
- Lines of symmetry and reflection (YEAR 7 SPR2/SU2)

All video clip references
belong to  hegartymaths
www.hegartymaths.com

Year 8 SUM1 Constructions

Find the loci of points which are equidistant from a fixed point or line.  **674**


Find the loci of points which are equidistant from two fixed points.

 **660,674**


Find the shortest route from a point to a line.

 **15**

Find the loci of points which bisect an angle between two lines.

 **661,674**

Solve problems combining different loci and constructions.

 **675-677**

 **683** Construct triangles given different combinations of sides and angles.

Next steps: YEAR 10 Route A and B


- Bearings
- Solve loci problems involving scales

Prerequisite learning:

- Area and perimeter of rectangles, triangles and trapeziums (YEAR 7 AUT1/ SPR 2)
- Know properties of 2D shapes (YEAR 7 SPR 2)

All video clip references belong to  hegartymaths
www.hegartymaths.com

YEAR 8 SU2 3D shapes, capacity and volume

 **820,829**

Identify, faces, vertices and edges of a 3D shape.

Calculate the volume of a given cuboid.

 **568,569**


Know and convert between measurements for volume and capacity.

 **698,699**

Understand the properties of a prism, identify and name them.  **570**

Solve problems involving the volume of prisms.

 **570,571**

Calculate the volume of any prism.  **570**

Work backwards from a given volume of a prism to find other dimensions.

 **571**

Next steps:

Calculate the volume of compound prisms.  **571**

- Similar areas and volumes (YEAR 8 SU2)

Prerequisite learning:

- Angle properties of triangles (YEAR 7 SU1)
- Properties of shapes that are reflected, rotated, translated or enlarged (YEAR 7 SU2)

All video clip references belong to  hegartymaths
www.hegartymaths.com

YEAR 8 SU2 Similarity and congruence




822


Use correct symbols and notations for describing properties of shapes.

Perform and describe translations, rotations and reflections of shapes  **637-641**

Understand the term congruence and identify congruent shapes.

 **680,681**

Enlarge shapes with a scale factor greater than 1.

 **642,643**

Understand the term similar and how it links to enlargements..

 **651**


Solve problems involving congruency and similarity.

 **614**


Prove two triangles are congruent.

 **682**

Perform an enlargement with a fractional scale factor.

 **644,645**

Find lengths, areas and volumes in similar shapes.

 **615,618**

Next steps: Year 9 SPR1 geometry

YEAR 11 Route A/ B bespoke

- Solve problems involving similar area and volume
- Prove two shapes which overlap are congruent.

Prerequisite learning:

- Solving/substitution (year 7/8 AUT 1)
- Using a protractor (YEAR 7 SU1)
- Indices and roots with the use of a calculator (YEAR 8 SPR2)

Reflective symmetry
and order of
rotation.

 **827,828**

All video clip references
belong to  **hegartymaths**
www.hegartymaths.com

YEAR 9 SPR
1GEOMETRY

Define and identify polygons
and types of triangle.

 **822-824**

Identify types of angles.
Estimate, measure and draw angles.


 **455-461**

Congruency
of 2D shapes.  **680-682**

Angles on a straight line, in
triangles, around a point and
vertically opposite.


 **477-480**


Identify parallel lines
and their angle facts.  **481-483**

Calculate interior and
exterior angles in
polygons.  **560-565**

Apply Pythagoras' theorem
to a line on a coordinate grid.  **501-502**

Calculate missing lengths using
Pythagoras' Theorem in 3D.

 **505-507**

Calculate missing lengths
using Pythagoras' theorem
in 2D.  **498-499**

Know exact values for
particular trigonometric ratios.  **508**

Use trigonometric ratios to
find angles and lengths in 2D.

 **509-512**

 **515**
Calculate angles of
elevation and depression.

Next steps:

- Using trigonometry within bearings. (year 11 B)
- Sine and cosine rule (year 11 B)
- Calculating the area of a triangle using sine.

YEAR 10 ROUTE A

Prerequisite learning:


- Recall square numbers from 1×1 up to 15×15 (Year 7 AU2/Year 8 SPR1).
- Indices and roots with the use of a calculator (Year 9 AUT1)
- Rearranging formulae (YEAR 8 AUT1 YEAR 9 AUT 2)

All video clip references
belong to  hegartymaths
www.hegartymaths.com


YEAR 10 SPR1 RIGHT ANGLED TRIANGLES

Calculate the length of a shorter
side using Pythagoras' Theorem.

  499

Calculate the length of a
hypotenuse using Pythagoras'
Theorem.  498

Apply Pythagoras' theorem
to a line on a coordinate grid.

 501-502

Use trigonometric ratios to
find angles and lengths in 2D.

 509-512

Calculate angles of
elevation and depression.

  515

Know exact values for
particular trigonometric ratios.

 508

Next steps:

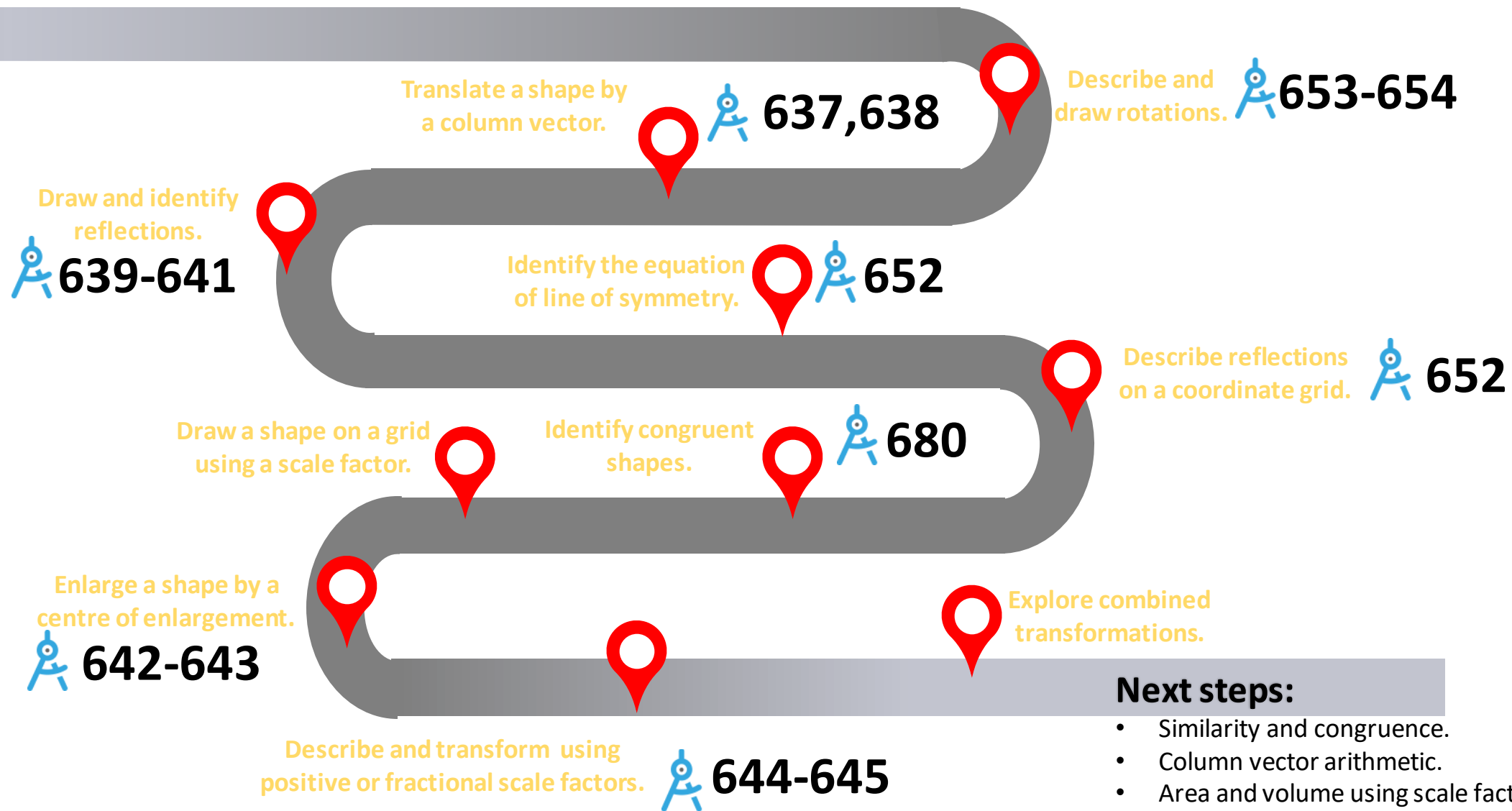
- Apply Pythagoras' theorem and simple trigonometry (SOH CAH TOA) in real life context. and within compound 2D shapes.

Prerequisite learning:

- Lines of symmetry and rotational symmetry (Year 8 SPR 1)
- Reading scales on a coordinate axes (Year 8 SPR 1/2)
- Coordinates in four quadrants including direction (Year 8 SPR1/2)

All video clip references belong to  hegartymaths
www.hegartymaths.com

Year 10 SUM1 Transformations



Prerequisite learning:

Draw and measure lines and angles (Year 7 SPR1 and SUM 1)

Understand clockwise and anticlockwise (year 8 SPR1)

Draw circles and arcs (Year 8 SPR 2)

All video clip references belong to  hegartymaths
www.hegartymaths.com

YEAR 10 SUM2 CONSTRUCTION AND LOCI

Make accurate drawings of 2D shapes with a ruler and a protractor



832

Identify and sketch planes of symmetry of 3D solids

Know the terms faces, vertex and edge

Draw sketches of 3D solids  832

Understand and draw front and side elevations and plans from simple solids



837-840

Given the plan, front and side, sketch 3D solids



841-844

Identify congruency in shapes (triangles)



680-682

Use a pair compasses to do standard constructions



660-668,683

Find and construct regions satisfying combinations of loci



674-679

Use 3 figure bearings



492-496

Solve Locus problems involving bearings

Next steps:

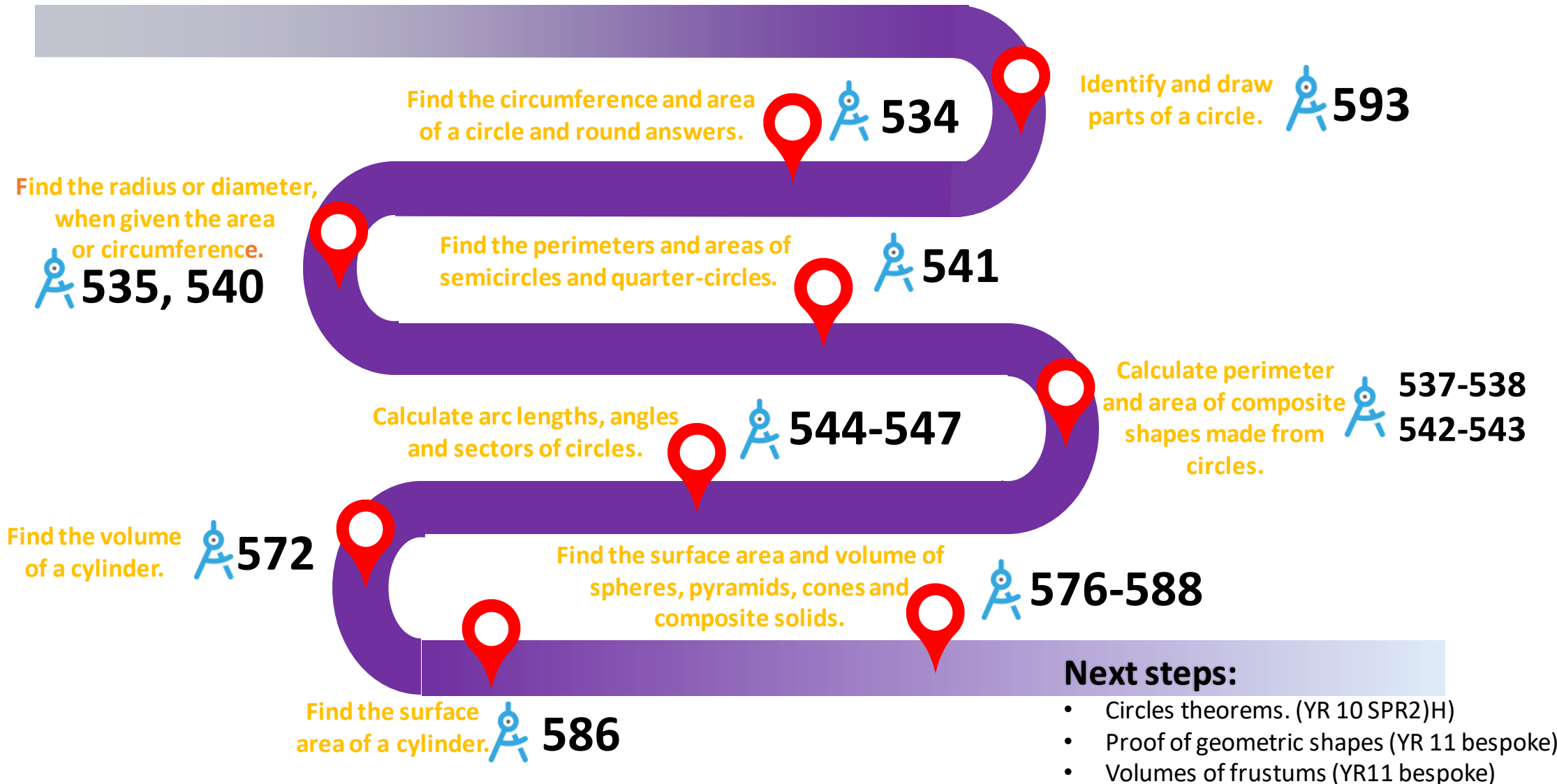
Bearings and trigonometry
Bearings and sine and cosine rule
Bearings with scale diagrams

YEAR 11 ROUTE A

Prerequisite learning:

- Perimeter of triangles, quadrilaterals and polygons (Yr7 AUT2, SPR 1)
- Awareness of Pi on a calculator (Yr 7 AUT1 YR8 SPR1) Area of 2D shapes and volume of 3d prisms Yr7 SPR1, Yr8 SPR1/2, YR9 SPR1)

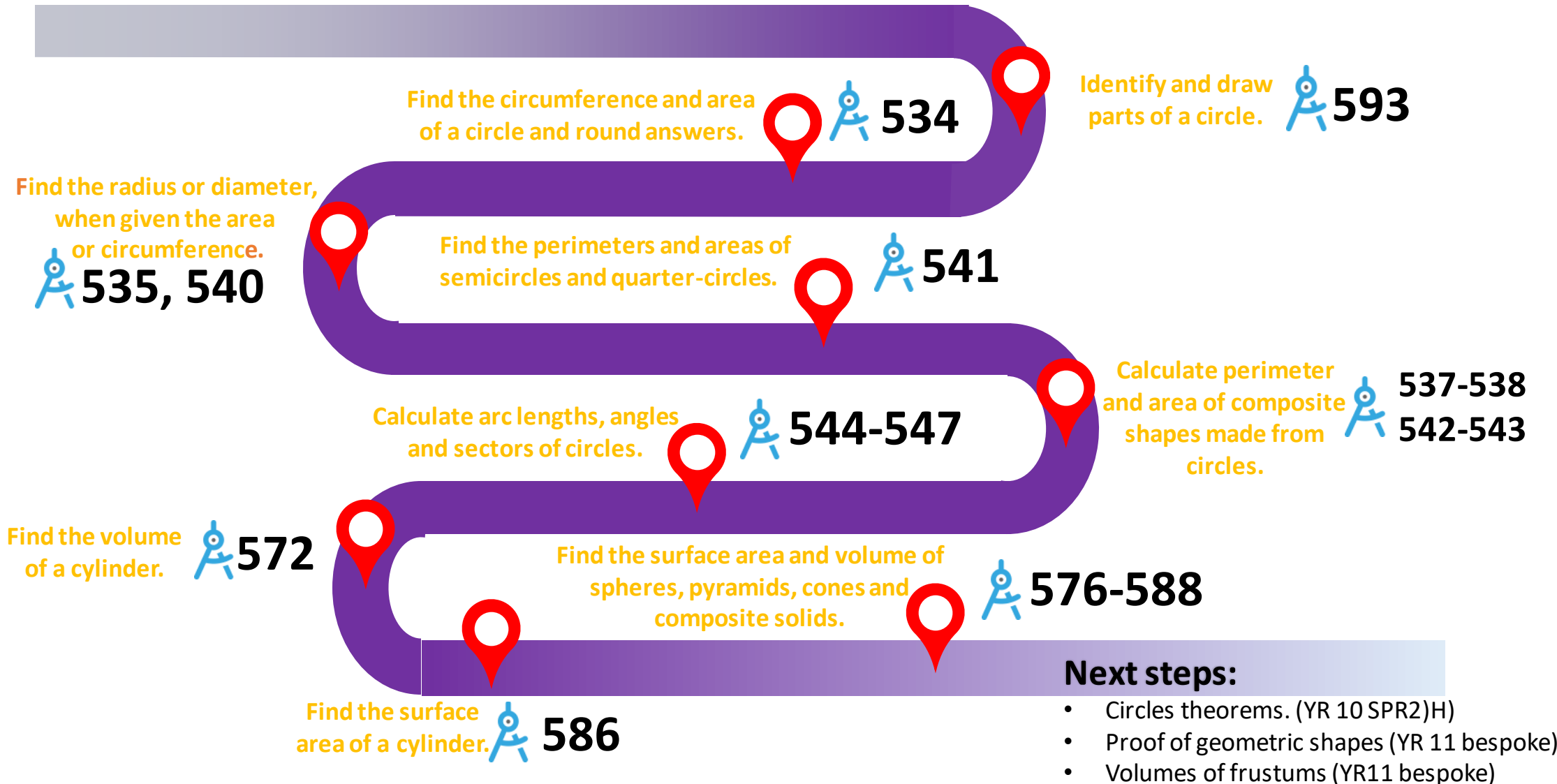
Circles, cylinders, cones and spheres



Prerequisite learning:

- Perimeter of triangles, quadrilaterals and polygons (Yr7 AUT2, SPR 1)
- Awareness of Pi on a calculator (Yr 7 AUT1 YR8 SPR1) Area of 2D shapes and volume of 3d prisms Yr7 SPR1, Yr8 SPR1/2, YR9 SPR1)

Circles, cylinders, cones and spheres



Prerequisite learning:

- Perimeter and area of 2D shapes (YR7 SPR1)
- 2D shape properties (YR7 SPR2)
- Angle facts (YR7 SUM1, YR9 SPR 1)
- Transformations (enlargements and column vectors) (YR8 SPR2)
- Basic similarity and congruence (YR8 SUM2)


All video clip references
belong to  hegartymaths
www.hegartymaths.com

Similarity and congruence


Congruence SAS, ASA,SSS and RHS

 **682**

Identify shapes which
are similar.

 **608-610**

Identify scale factor of enlargements between two
corresponding sides

 **611-613**

Understand use column notation
in relation to vectors

 **623-624**

Calculate using column vectors, and
represent graphically, the sum of two vectors

 **586**

Next steps:


- Vector Geometry (YR11 H)
- Vector proof (YR11 H)


YEAR 10 ROUTE B


Prerequisite learning:

- Rounding (YR 7 AUT1)
- Adding and multiplying integers and decimals (YR7AUT1)
- Identify 2d and 3D shape properties (YR 7 SPR2,YR8 SUM2)

Perimeter, area and circles, cones spheres, accuracy and bounds YR10 AUT 2

Perimeter and area of 2D shapes, including compound shapes  **550-559**


Find the circumference and area of a circle working backwards and round answers.  **534-535, 539-540**

Identify and draw parts of a circle.  **593**

Calculate arc lengths, angles and sectors of circles.  **544-547**

Calculate surface area of 3D shapes  **584-586**

Calculate volume and surface area of pyramids, cones and spheres  **576-581, 587, 588**

Calculate volume 3D shapes including cylinders  **568,586**

Calculate upper and lower bounds, and error intervals  **411**

Use bounds in questions involving the four operations  **576-588**

Next steps:

Calculate compound area, volume and SA
Algebra to geometric problems
Determine sensible bounds in calculations

Prior learning:

- Recall angle facts and circle properties. (YR8 SPR1, YR9 SPR1)
- Secure understanding of circle terminology. (YR8 SPR 1)
- Drawing circles using a compass. (YR8 SPR1)

All video clip references
belong to  hegartymaths
www.hegartymaths.com

Circles

Understand a tangent is perpendicular
to the radius where it meets the circle.



594-602

Prove and use the
circle theorems.



594-606

Draw graphs based on
circles and perpendiculars.



594-602

Find and give reasons for
missing angles using
multiple circle theorems.



593

Find the equation of
a tangent to a circle.



320

Recognise and construct a
circle on a coordinate
grid.



314

Next steps:

- Within Further Maths GCSE and A Level Maths you will use the general circle equation:

$$(x - a)^2 + (y - b)^2 = r^2$$


Prior learning:

- Reading scales on a coordinate axes. (year 8 SPR 1)
- Coordinates in four quadrants including direction (year 8 SPR 1)
- Equations of horizontal and vertical lines. (Year 8 SPR1/2 Year 10 AUT1/SPR 1)


All video clip references belong to  hegartymaths
www.hegartymaths.com

Transformations SUM 1

Describe and draw rotations.

 **653-654**


Translate a shape by a column vector.

 **639-641**

Recognise and describe reflections.

 **652**

Describe and transform shapes using enlargements by a positive, fractional or negative scale factor.

 **642-647**

Find area scale factors.


Describe and transform using combined transformations.

 **680**


Describe and draw front and side elevations and plans.

 **837-844**


Use and interpret maps and scale drawings.

 **674-679**

Understand, draw and measure bearings.

 **492-495**

Constructions and Loci

 **674-679**
660-665

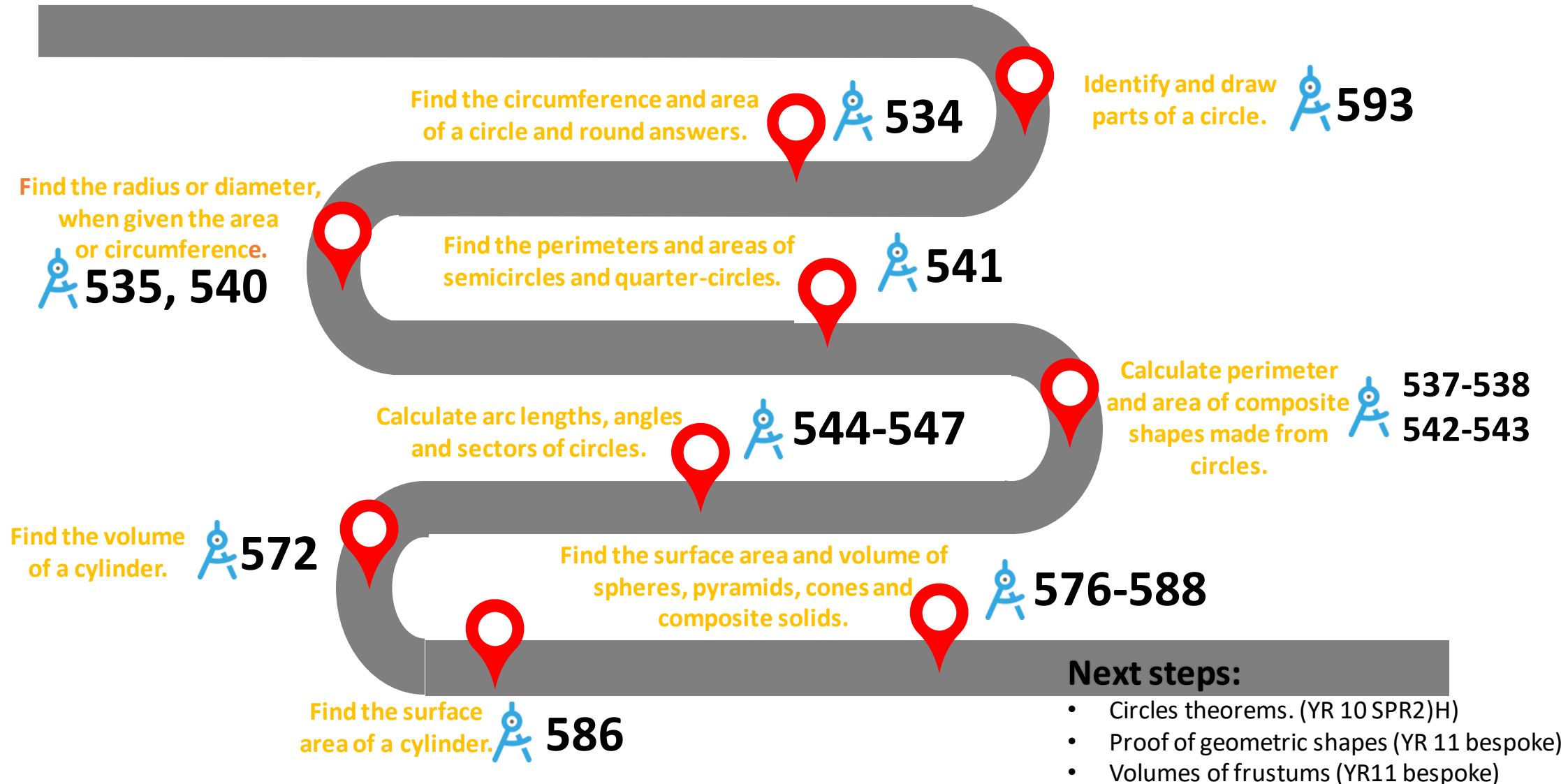
Next steps:

- Similarity and congruence.(YR11 H)
- Column vector arithmetic.
- Transformations of curves.

Prerequisite learning:


- Perimeter of triangles, quadrilaterals and polygons (Yr7 AUT2, SPR 1)
- Awareness of Pi on a calculator (Yr 7 AUT1 YR8 SPR1) Area of 2D shapes and volume of 3d prisms Yr7 SPR1, Yr8 SPR1/2, YR9 SPR1)

Circles, cylinders, cones and spheres



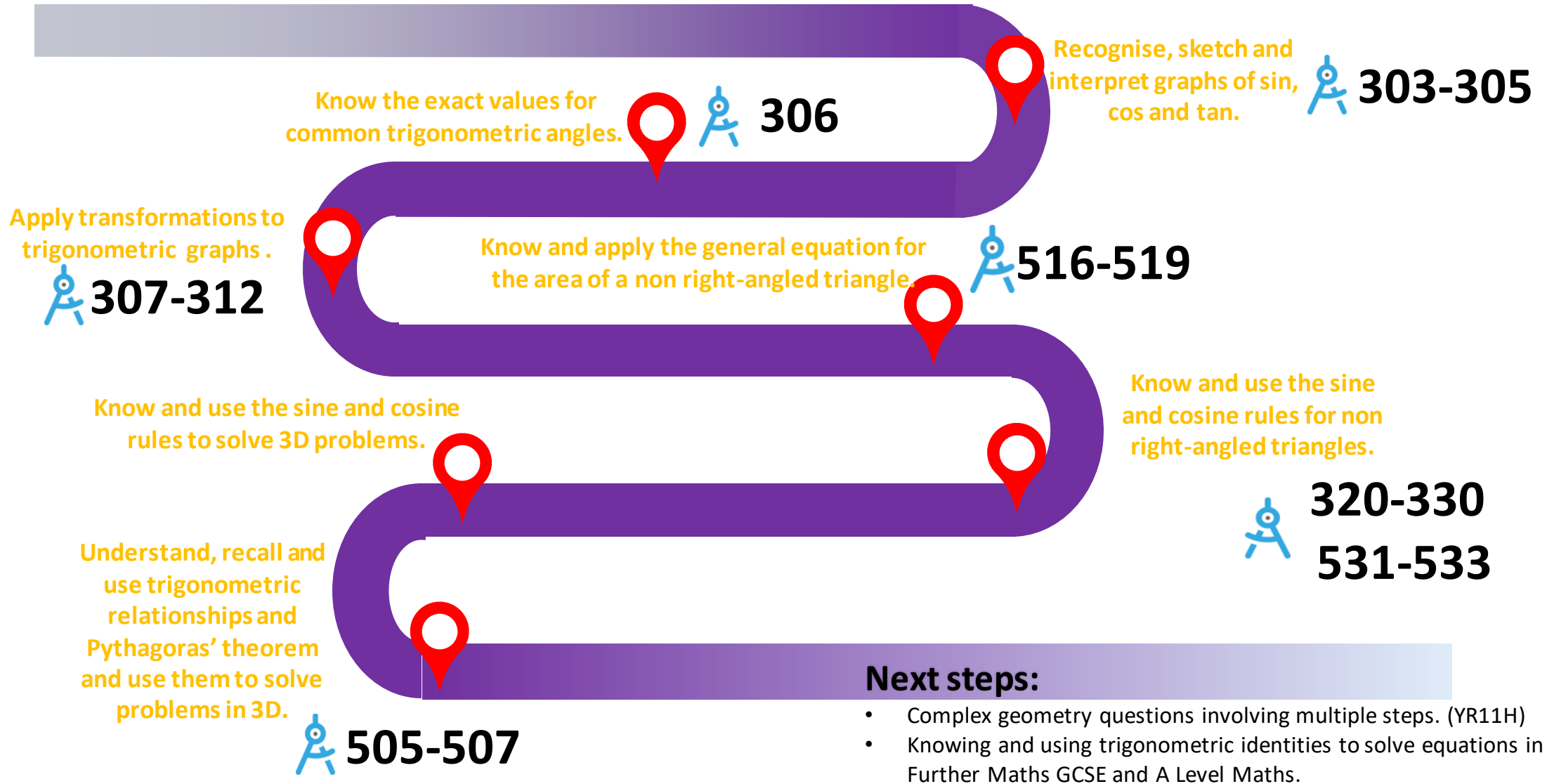
YEAR 11 ROUTE B

- Trigonometric functions

All video clip references belong to  hegartymaths www.hegartymaths.com

PREREQUISITIE LEARNING (YEAR 9 SPR1:

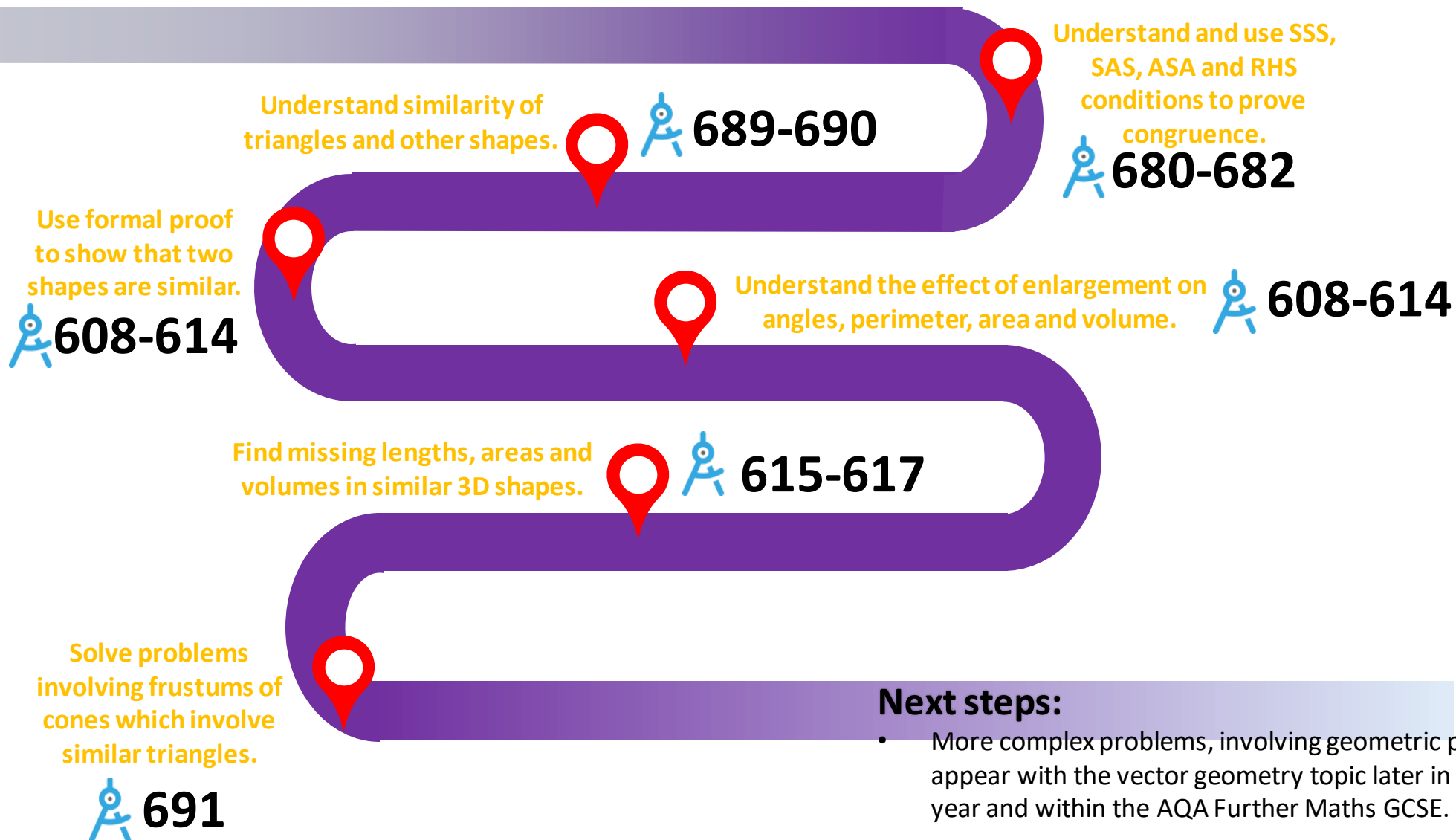
- Applying Pythagoras' theorem
- Trigonometry basics (SOH CAH TOA)
- Recall exact Trig values for 0° , 30° , 45° and 60° and 90° .



Prerequisite learning:

- Metric conversion, including mm² to cm² and others. (YR7)
- Recall geometry facts for angles and sides of 2D shapes (YR7 SUM1)
- Using scale factors to enlarge 2D shapes. (YEAR 8 SUM2)
- Ratio, including 1:n and n:1. (YR8 AIT2)

– Similarity and congruence



Prerequisite learning

- Using column vectors for translations (YR8 SPR1,
- Secure understanding of algebraic rules (YR9 SUM2)
- Applying Pythagoras' theorem.(YR9 SPR1)

Vector geometry

