St. Mary's Catholic High School, Muhaisnah

Area and Circumference of a circle

LO: To accurately calculate the area and circumference of a circle.

SUCCESS CRITERIA

All students should be able to calculate the area and circumference of a circle.

Most students should be able to calculate the area and perimeter of a semi-circles and quarter circles.

Some students should be able to calculate the area and perimeter of compound shapes involving circles.

Area and Circumference of a circle

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KEYWORDS:

Circle, area, circumference, perimeter, radius, diameter, compound shape, ∏

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MENTAL MATH

Calculate the following using your calculator:

1) $3.5^2 = 12.25$
2) $6.7^2 = 44.89$
3) $2.4^2 = 5.76$
4) $1.75^2 = 3.0625$
5) $3.85^2 = 14.8225$

Bonus: can you find this button? Do you know what it does?

π

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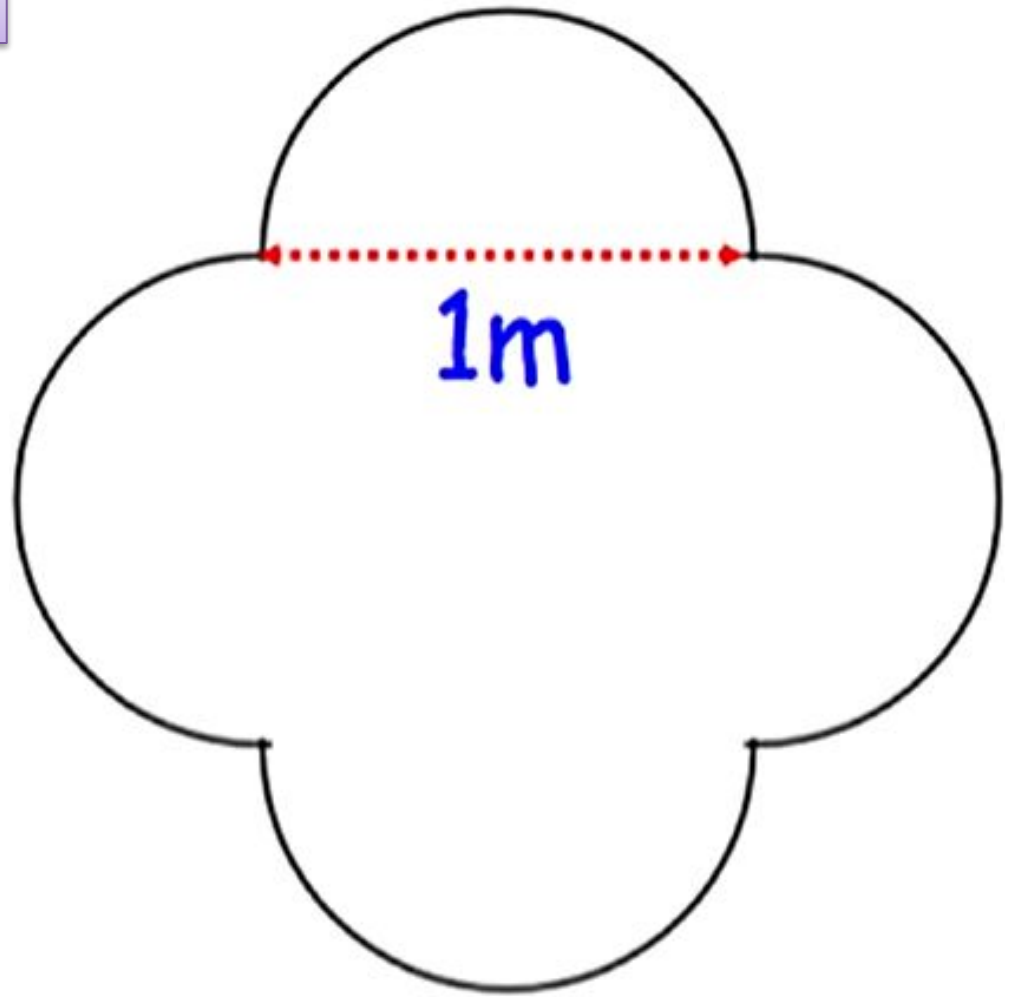
STARTER

Shown is a table top.
It is made from a 1m square and four semicircles.

Calculate the perimeter of the table top.



$$P = \frac{2\pi r}{2} \; or \; \frac{\pi d}{2}$$

$$= \frac{3.14 \times 1m}{2} \times 4$$

$$= 6.28 \text{ m}$$

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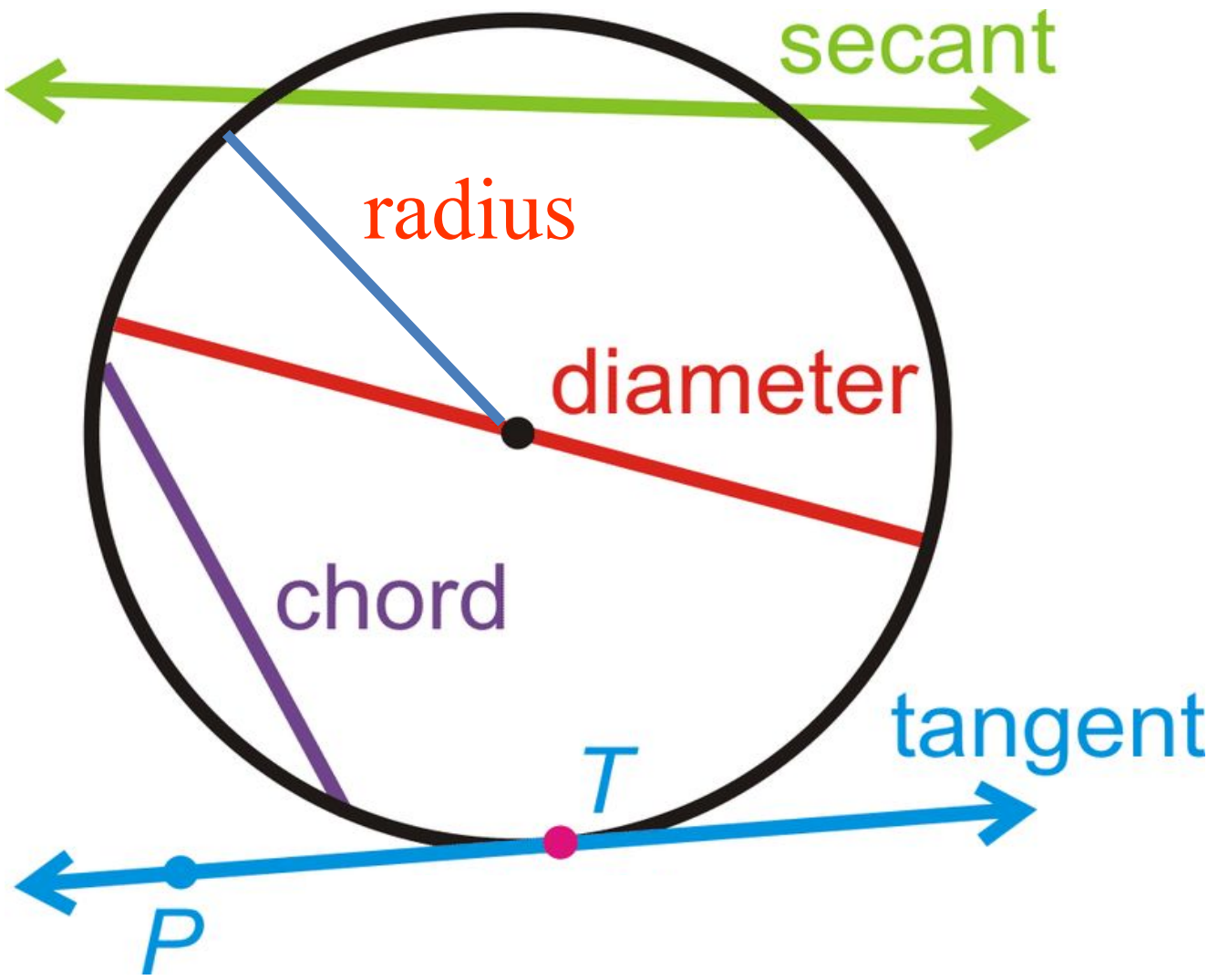
KEY CONCEPT

LO: To accurately calculate the area and circumference of a circle.



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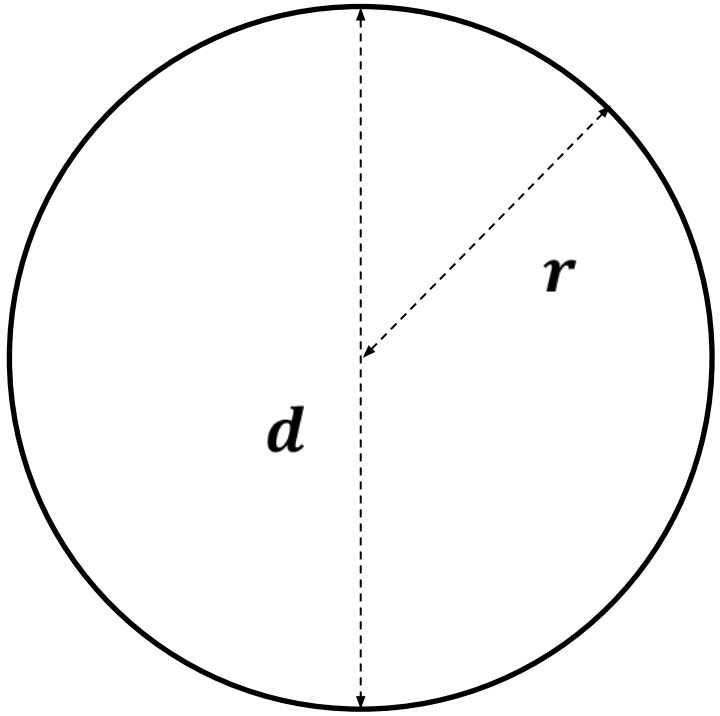
KEY CONCEPT

LO: To accurately calculate the area and circumference of a circle.



Circumference of a Circle

- Formula is $C = 2\pi r$ (2 x Pi x Radius)

  or

  $C = \pi d$ (Pi x Diameter)

- Remember…$\pi = 3.14$ (approximately)

**You can use either formula depending on what they give you in the original problem*

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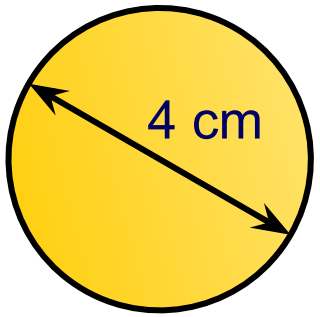
My/Your Turn

LO: To accurately calculate the area and circumference of a circle.

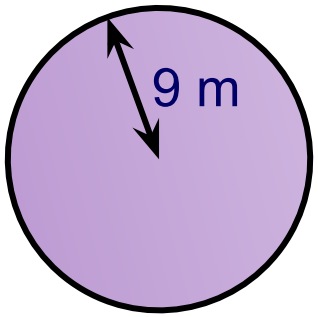
Use $\pi = 3.14$ to find the circumference of the following circles:



$C = \pi d$

$= 3.14 \times 4$

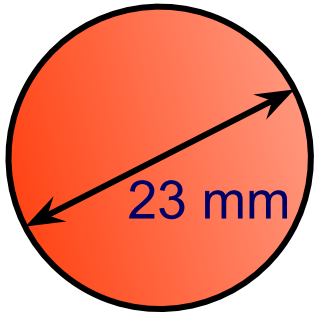
$= \mathbf{12.56\ cm}$



$C = 2\pi r$

$= 2 \times 3.14 \times 9$

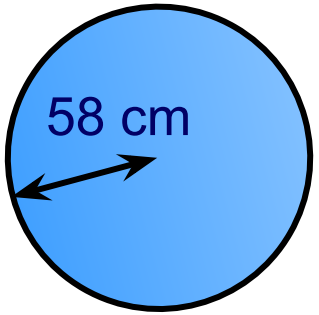
$= \mathbf{56.52\ m}$



$C = \pi d$

$= 3.14 \times 23$

$= \mathbf{72.22\ mm}$



$C = 2\pi r$

$= 2 \times 3.14 \times 58$

$= \mathbf{364.24\ cm}$

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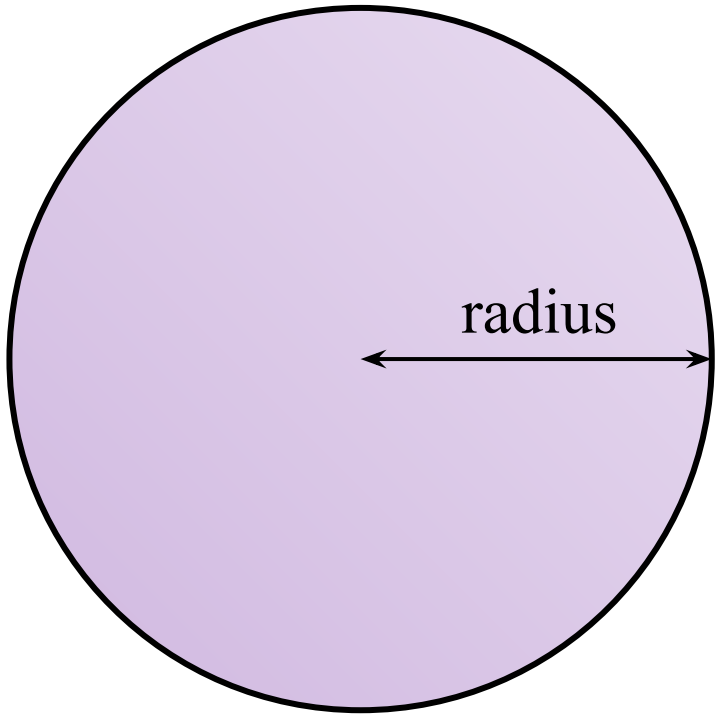
KEY CONCEPT

LO: To accurately calculate the area and circumference of a circle.

Area of a Circle

- Formula is $A = \pi r^2$ (Pi x Radius Squared)



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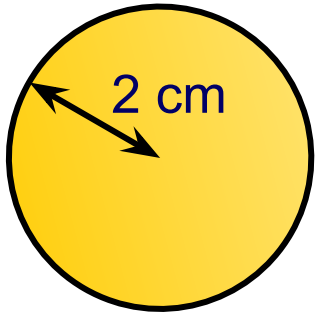
My/Your Turn

LO: To accurately calculate the area and circumference of a circle.

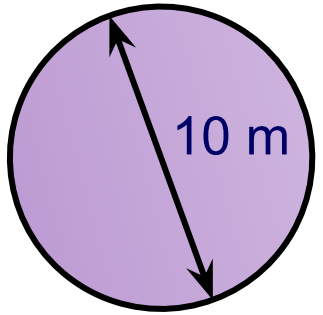
Use $\pi = 3.14$ to find the area of the following circles:



$A = \pi r^2$

$= 3.14 \times 2^2$

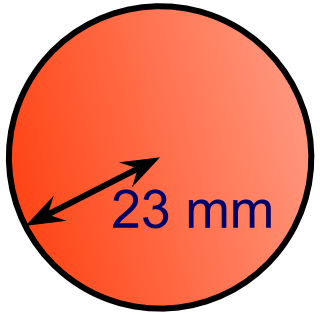
$= \mathbf{12.56\ cm^2}$



$A = \pi r^2$

$= 3.14 \times 5^2$

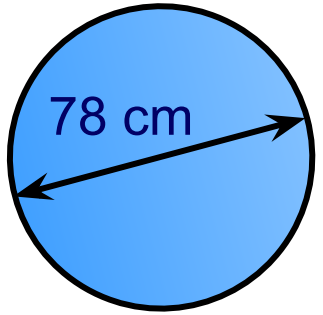
$= \mathbf{78.5\ m^2}$



$A = \pi r^2$

$= 3.14 \times 23^2$

$= \mathbf{1661.06\ mm^2}$



$A = \pi r^2$

$= 3.14 \times 39^2$

$= \mathbf{4775.94\ cm^2}$

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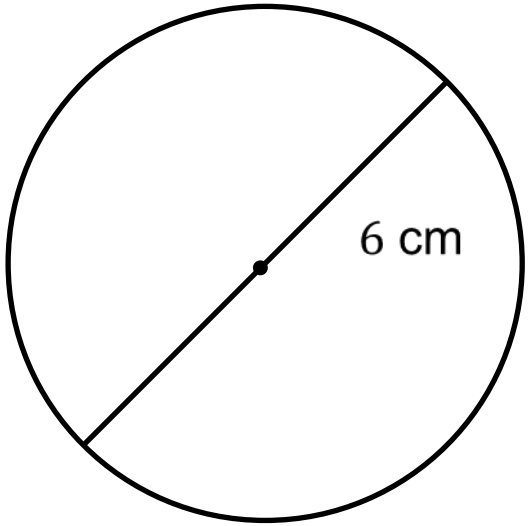
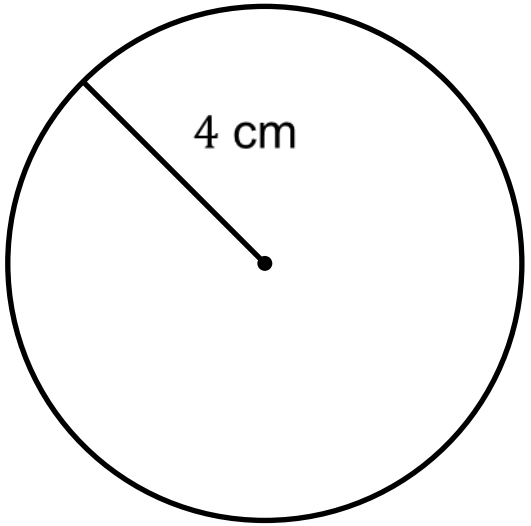
Mini-Plenary

LO: To accurately calculate the area and circumference of a circle.

Calculate the area and circumference of these circles:





$A = \pi r^2$
$= \pi \times 3^2$
$= 28.27$ cm²

$C = \pi d$
$= \pi \times 6$
$= 18.85$ cm

$A = \pi r^2$
$= \pi \times 4^2$
$= 50.27$ cm²

$C = \pi d$
$= \pi \times 8$
$= 25.13$ cm

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Area and Circumference of a circle

LO: To accurately calculate the area and circumference of a circle.

Calculate the **area** and **perimeter** of the following in the RAG task. Give your answers correct to 2 decimal places.

CORE TASK

Edexcel GCSE
Mathematics (Linear) – 1MA0

AREA & CIRCUMFERENCE OF CIRCLES

GROUP -1 & 2 – Q1 – Q5
GROUP -3 & 4 – Q6 – Q10
GROUP -5 – Q11 - 14

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Example

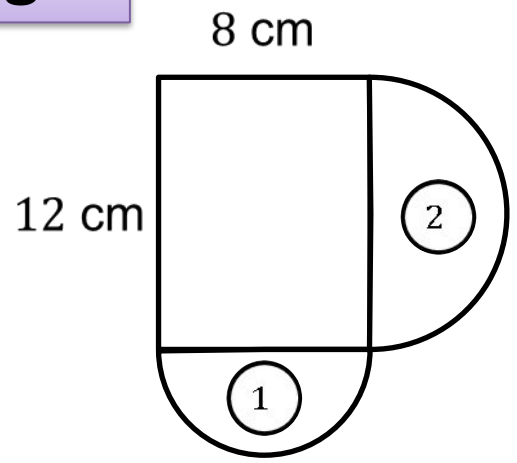
The diagram shows a shape made of two semi-circles and a rectangle.

a) Calculate the **area** of the shape.

b) Calculate the **perimeter** of the shape.

Give your answers correct to 2 decimal places.

Challenge



Area of rectangle $= 8 \times 12 = 96$ cm^2

Area of $(1) = \pi \times 4^2 \div 2 = 25.13$ cm^2

Area of $(2) = \pi \times 6^2 \div 2 = 56.55$ cm^2

Total area $= 96 + 25.13 + 56.55$

$= 177.68$ cm^2

Arc of $(1) = \pi \times 8 \div 2 = 12.57$ cm

Arc of $(2) = \pi \times 12 \div 2 = 18.85$ cm

Total perimeter $= 12 + 8 + 12.57 + 18.85$

$= 51.42$ cm

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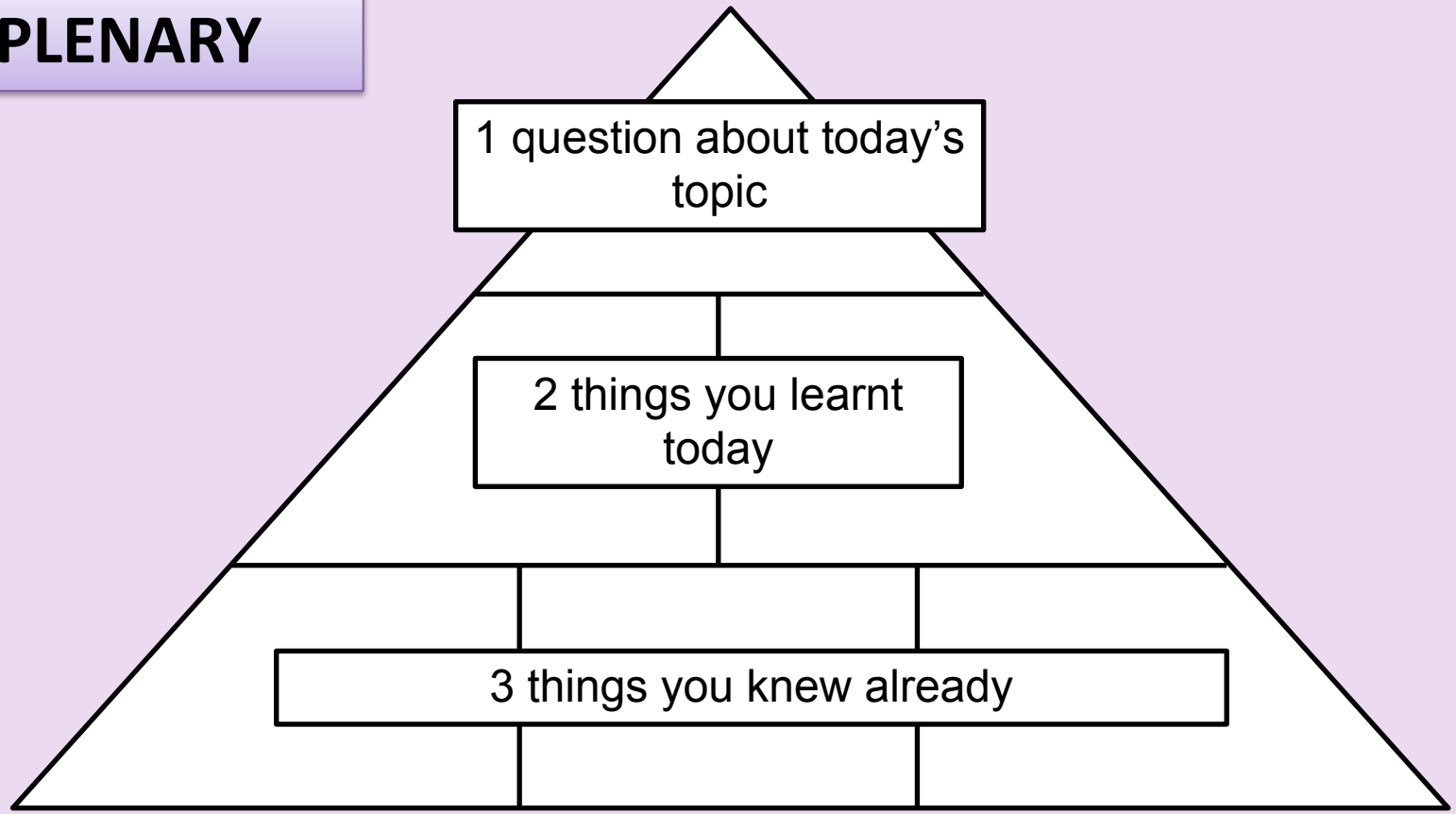
Lesson Objectives:

Developing students will be able to calculate area and circumference of circles.

Secure students will be able to calculate area and perimeter of semi-circles and quarter circles.

Excelling students will be able to calculate area and perimeter of compound shapes comprised of circles.

PLENARY



Keywords

Circle, area, circumference, perimeter, radius, diameter, compound shape, pi (π)