MATHS IN MOTION

AROUND IN CIRCLES

LEVEL

Level 7 – Level 8

ACTIVITY DESCRIPTION

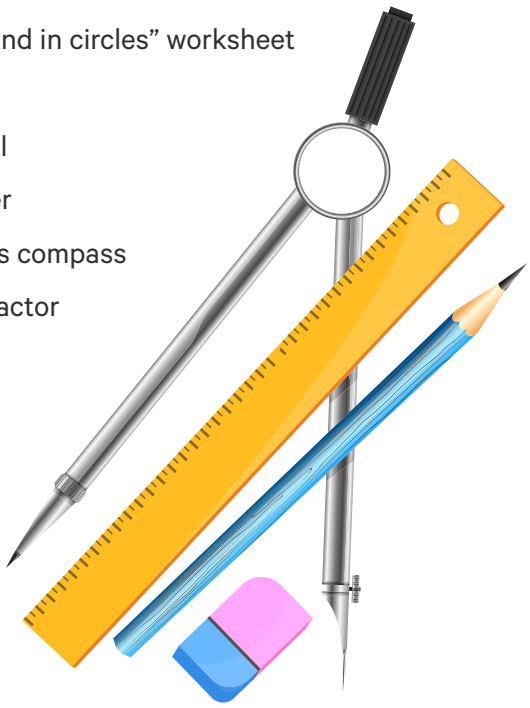
Puffing Billy Railway's Rolling Stock Branch have the skills, equipment and the know how to keep everything moving in the right direction. Calculations of circular parts such as gears and wheels are an important and everyday occurrence at the maintenance, repairs, and restoration workshop. Students explore the features of circles, draw, construct, and label angles using a compass.

THEME

Measurement and Geometry

MATERIALS REQUIRED

- Workbook
- "Around in circles" worksheet
- Ruler
- Pencil
- Eraser
- Maths compass
- Protractor



INSTRUCTIONS

CONSTRUCTING AN ANGLE BISECTOR

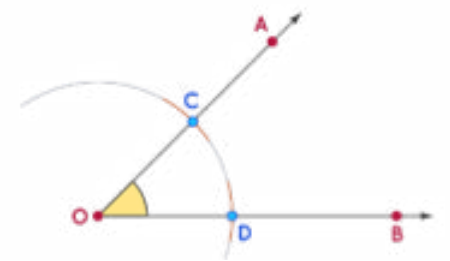
Using the background information provided, discuss the common features of a circle, and draw a diagram for students to copy into their workbooks.

As a whole group activity provide the following step-by-step example of constructing an angle bisector.

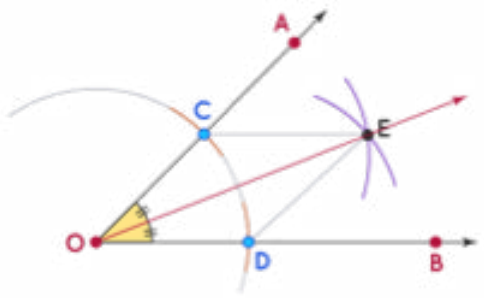
Ask students to gather their materials (ruler, pen, compass, protractor, workbook) to bisect an angle.

< AOB by following steps 1 to 8.

1. First draw an angle and label < AOB. The size of the angle is not important. Refer to example below.

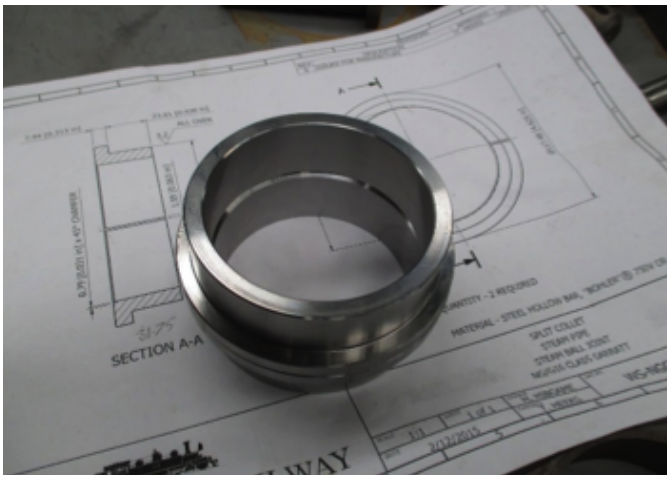


2. With your compass, construct an arc with centre O to produce points C and D.
3. With the same radius construct an arc with centre C and another with centre D.
4. Construct E so that the intersecting arcs have the same radius.
5. Mark in the ray OE.
6. Measure <AOE and <DOE. What do you notice?



7. That's correct! The angles are equal, <AOE = <BOE.
8. Ask students "Where on the Railway would you use this information?"

Once students have a sound understanding of the features of a circle and associated angles and can capably use the maths compass, ask each student to complete the "Around in Circles" worksheet.



SUGGESTIONS FOR ASSESSMENT

Ability to follow step by step guided instructions and successful completion of the "Around in Circles" worksheet.

BACKGROUND INFORMATION

Common features of circles include:

Centre – point at an equal distance from all points on the circle

Radius – line interval joining the centre to a point on the circle

Chord – line interval joining two points on the circle

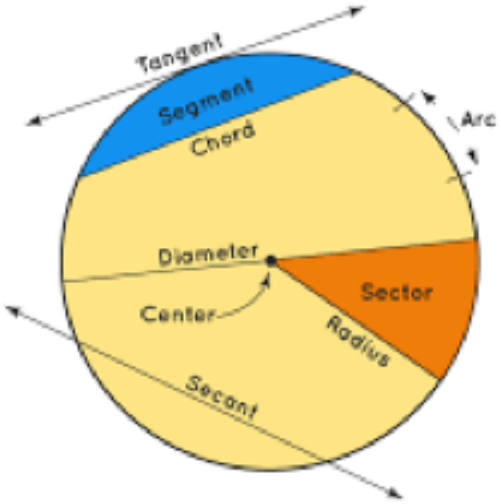
Diameter - longest chord passing through the centre

Secant - A line that intersects a circle in two points

A Ray - is a part of a line that has one endpoint and goes on infinitely in only one direction. You cannot measure the length of a ray. A ray is named using its endpoint first, and then any other point on the ray

Arc – part of the circle. It is possible for a circle to have either a minor or major arc.

PARTS OF A CIRCLE



CURRICULUM LINKS

Mathematics

Level 8

Measurement and Geometry

Investigate the relationship between features of circles such as circumference, area, radius, and diameter. Use formulas to solve problems involving determining radius, diameter, circumference, and area from each other (VCMMG288)

WORKSHEET – AROUND IN CIRCLES

1. Use a compass to draw a circle with a radius of 4cm. Then mark and label these features:
   a. Centre O
   b. Two points A and B, at any place on the circle
   c. Radius OA
   d. Chord AB
   e. Minor arc AB

2. Use a ruler to draw a segment AB of length 6cm and then complete the following:
   a. Construct a circle with radius 3cm with centre A.
   b. Construct a circle with radius 3cm with centre B.
   c. Do your two circles miss, touch or overlap? Is this what you expected?

3. Follow the steps to create a 60-degree angle.
   a. Draw a line segment, AB of 5 cm in length
   b. Construct an arc with centre A and intersecting the segment AB at C
   c. With the same radius construct an arc with centre C and intersecting the first arc at D.
   d. Draw the ray AD and measure <BAD
   e. What did you notice?