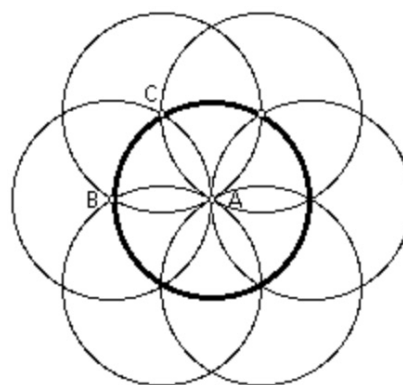
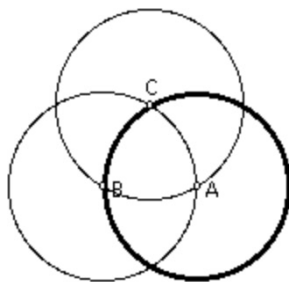
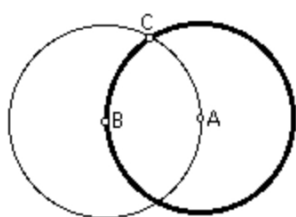
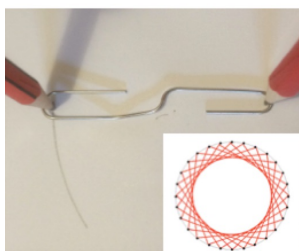


CONSTRUCT WITH CIRCLES



PAPERCLIP COMPASS



To draw circles you can use a paperclip instead of a pair of compasses.
See the video on

<https://aiminghigh.aimssec.ac.za/years-7-9-construct-with-circles/>

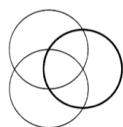
- Draw 2 circles with equal radii intersecting at C. Each must go through the centre of the other.
 - Draw a third circle of the same radius with centre C.
 - Draw 4 more circles with centres on the circle centre A and passing through A.
- Follow this sequence of steps.



1.



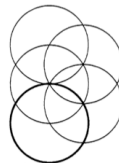
2.



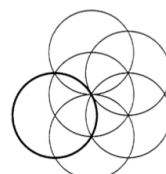
3.



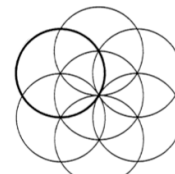
4.



5.



6.



7.

See <https://www.facebook.com/jain108academy/videos/620865948683694>

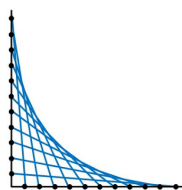
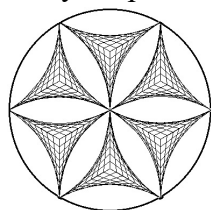
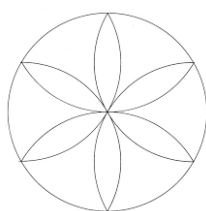
HELP

For guidance on using geometrical instruments to measure lengths and angles, and to draw circles, see the worksheet:

<https://aiminghigh.aimssec.ac.za/wp-content/uploads/2016/11/Learners-worksheet.pdf>

NEXT

Draw straight lines in your pattern. Choose points to join carefully. For a challenge see below.



Work out how to draw the slightly simpler design on the left. Then extend it to the design beside it.

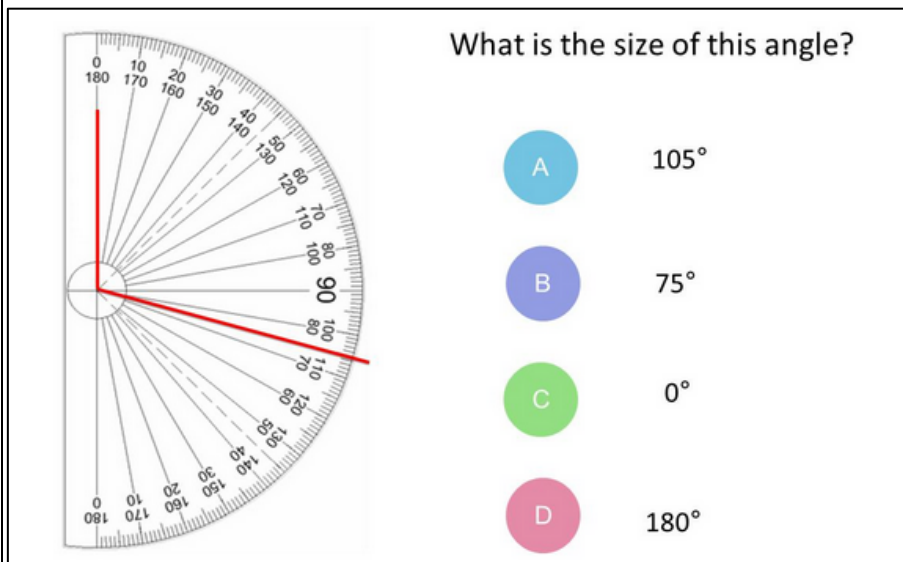
It is a clever combination of the methods of constructions with circles and constructions with lines.

GUIDE FOR HOME LEARNING

Diagnostic Assessment This should take about 5–10 minutes at the start of the session.

1. Show this question and say:

“Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 fingers for D”.



2. Notice how the learners respond. Ask learners to explain why they gave their answers and DO NOT say whether it is right or wrong but simply thank the learner for giving the answer.

3. It is important for learners to explain the reason for their answer. Other learners should listen and try to decide if they gave the right or wrong answer.

4. Ask the group again to vote for the right answer by putting up 1, 2, 3 or 4 fingers. Notice if there is a change and who gave right and wrong answers.

The concept is needed for the lesson to follow. If the learners are not confident about measuring angles then use the guidance on using geometrical instruments to measure lengths and angles, and to draw circles, see the worksheet: <https://aiminghigh.aimssec.ac.za/wp-content/uploads/2016/11/Learners-worksheet.pdf>

A. is the correct answer.

Common Misconceptions

B. Does not recognise that the angle is obtuse. Reads the acute angle on the scale.

C. Reads from the red line, no understanding of angle measurement.

D. Reads from the red line, no understanding of angle measurement.

<https://diagnosticquestions.com>

Why do this activity?

This activity gives learners practice in using a ruler, protractors and compasses to draw accurate geometrical constructions. To make the patterns learners need to measure lengths and angles, to draw circles, to follow instructions and to draw accurately. The activity involves talking about the geometrical properties of shapes.

Learners of different ages and attainment levels can be given different patterns to draw. The activity may appeal to some learners who dislike mathematics and to others who find it difficult as it encourages creativity. It may improve learners' overall attitude to mathematics. Learners will enjoy experimenting with different ways to adapt the designs to make their own patterns.

Learning objectives

- **Measuring Angles** Accurately use a protractor to measure and classify angles: $< 90^\circ$ (acute angles); Right-angles; angles $> 90^\circ$ (obtuse angles); Straight angles; $> 180^\circ$ (reflex angles);
- **Constructions** Use a compass, ruler and protractor appropriately to construct geometric figures accurately including: angles, to one degree of accuracy and circles.

Generic competences

We need to prepare children for a job market where existing knowledge and skills have limited value unless they can be applied in novel ways to produce new knowledge that solves today's complex problems to improve the quality of life for all.

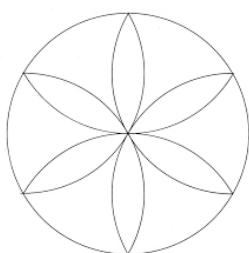
In doing this activity students will have an opportunity to:

- develop the skill of interpreting and creating visual images;
- engage in independent learning to develop manual dexterity in handling instruments.

Suggestions for Home Learning

Resources needed: Geometrical instruments including a ruler and protractor. A paperclip makes good compasses.

Start with practice in using a paperclip to draw circles



This is the easiest pattern to start with.

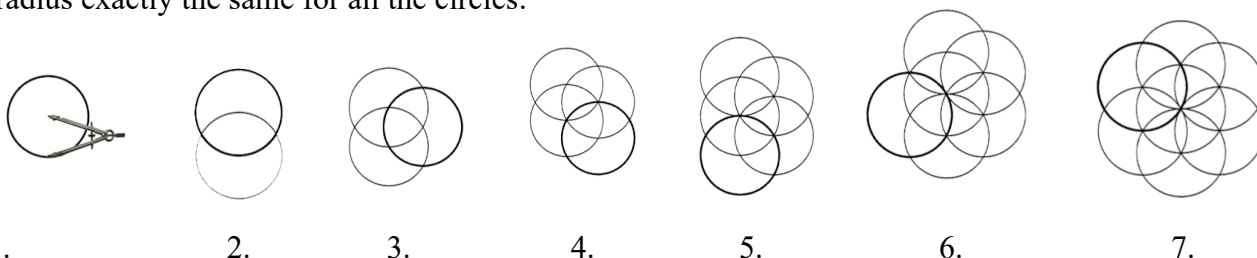
Draw a circle and keep the same radius for the whole drawing.

Choose any point on the circle and draw an **arc inside the circle**.

Using one of the points where the arc cuts the circle as centre, draw another **arc inside the circle**. Repeat to draw 4 more **arcs inside the circle**.

Tell the learners to copy this design and then the construction below (following the 7 steps). Tell them that after that they can create some of their own.

Guide the learners to follow this sequence of steps reminding them that it is essential that they keep the radius exactly the same for all the circles:



1.

2.

3.

4.

5.

6.

7.

When they have copied the simple design ask them what geometrical properties they can see in the design. Show them some other designs and tell the learners to design their own pattern.

EARLY YEARS

See <https://www.facebook.com/TheCarolineAinslie/videos/4026958580662627>

Follow up

Constructions with lines: <https://aiminghigh.aimssec.ac.za/years-7-9-constructions-with-lines/>

Construct circle and line patterns:

<https://aiminghigh.aimssec.ac.za/years-7-9-construct-circle-and-line-patterns/>

Flower of Life: <https://aiminghigh.aimssec.ac.za/years-6-10-flower-of-life/>