

STUDENT WORKSHEET

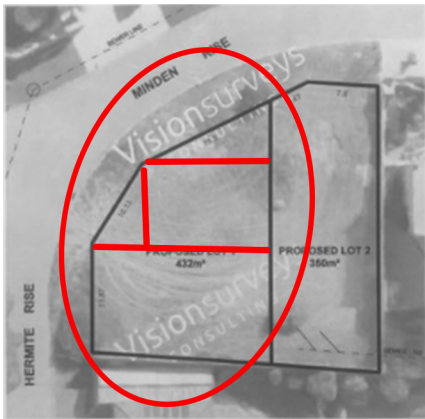
Designing a house means making the best use of the space available. Factors like block size, building regulations and cost affect the amount of space that can be used to design and build a house, so being able to apply mathematics to help make the best use of space is an essential skill.



ON YOUR OWN

Blocks of land are made up of different shapes or polygons.

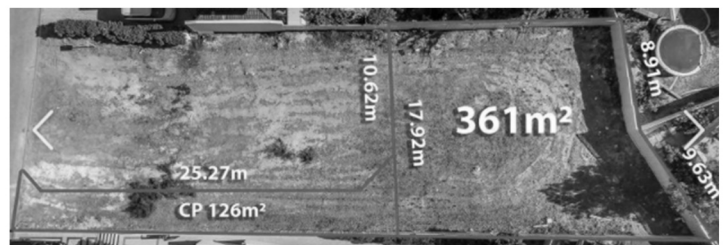
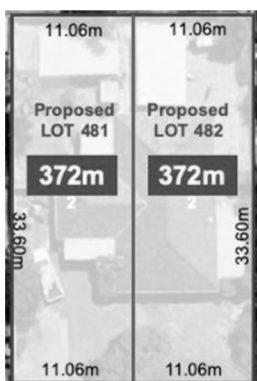
For example, the block below is made up of triangles and rectangles. These are identified by the internal lines drawn inside the perimeter of the block.



A 'polygon' is a two-dimensional shape with straight sides.

'Perimeter' is the outline of a shape.

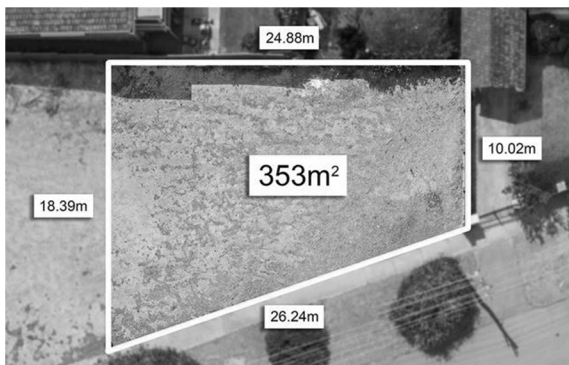
Have a look at the blocks of land below and identify the shapes or polygons that make up each block.



Search the Internet for images of other blocks of land to see if you can verify what you have found.

What conclusions can you draw about the polygons that most often make up blocks of land?

Now have a look at the block below.



'Area' is the overall size of the surface of a polygon.

Can you verify the accuracy of the calculation of the area of this block as shown on the image? How would you go about doing this?



WITH YOUR GROUP

When working in a group, allocate a note taker and speaker to report on your group's findings.

Share your conclusions on the polygons that most often make up blocks of land and how you could calculate the area of a block of land.

Discuss the information you need to be able to calculate area and the process of calculating the area of an irregular polygon. Identify the steps required and make sure you have a note of these.

Report back to the class and join in the class discussion on the process of finding the area of an irregular polygon. Your teacher will provide any information required to support your conclusions.

An 'irregular polygon' has internal angles of unequal sizes.



ON YOUR OWN

For the house floor plan below, calculate the overall area of the house and the area of each room. If you have any difficulties with calculating the area of the floor plan, please check in with your teacher.



ON YOUR OWN

The Construction Futures Centre website has information on a range of careers related to the process of home design. You can check out some of these at the links below.

<https://ctf.wa.gov.au/careers/design-manager/>

<https://ctf.wa.gov.au/careers/interior-designer/>

<https://ctf.wa.gov.au/careers/pre-start-consultant/>

<https://ctf.wa.gov.au/careers/residential-drafter/>

<https://ctf.wa.gov.au/careers/architectural-drafter/>

Do your own research on roles in the construction industry and create a table like the one below in Word, Excel or similar to record your findings.

Job Title	Role Description	Skills and qualifications	Source
Design Manager	The person who manages all processes in relation to producing a set of drawings that a project can be built from.	University degree	https://ctf.wa.gov.au/careers/design-manager/

WITH YOUR GROUP

Share and compare your findings on careers in the construction industry related to home design. Focus on skills the types of qualifications and/or training required.

Add to your notes during the discussion if others have located information you didn't come across.

ON YOUR OWN

Select one of the careers you have noted in your table and create a career pathway to show how you could get from where you are now to that job. The example below will help you to see how to construct a career pathway.

Job: Residential Drafter

Need to be good with: mathematics, computing, art and drawing, communicating and English.

Training required: Vocational certificate

To qualify for this job I will need to:

- Continue to study and achieve well in maths, English, computing, art.
- Complete year 12 and at least Certificate II in Construction Business.
- Do some work experience in the construction industry in a drafting role.



ON YOUR OWN

Create a diagram of a block of land showing the dimensions of each side so that the area can be calculated. Use only the shapes you have identified and agreed with your group are most often found in blocks of land and make sure that there is sufficient overall area to design a home that has at least three bedrooms.

Make your block shape and dimensions shape challenging, because you're going to swap with a partner and ask them to design a home to fit your block.

Challenging does not equal impossible!



WITH A PARTNER

Swap your block diagrams and challenge each other to design a home to fit the dimensions of each other's blocks, including at least three bedrooms and the other facilities you would expect to find in a house.

When thinking about what to include in your design, you can use your own home as a starter, refer to the home designs below, or do some research on the Internet. Most home builders include house plans on their websites.

Once you have created your design, check back in with your partner and explain why you have created your design the way that you have.

Once you have completed and discussed your plans, use some construction blocks and work together to build models of each other's house designs.

