CALCULATING THE AREA OF A FLOWER BED AND CALCULATING NUMBER OF PLANTS NEEDED

This Skills for Life Learning resource has been developed as part of the Project Skills for Life for World Class Skills Project 2009 -2010.

This is a draft document as part of the development of the products developed for the project.
CALCULATING THE AREA OF A FLOWER BED AND CALCULATING NUMBER OF PLANTS NEEDED

In order to work out how many plants are needed for a flower bed, we need to calculate the area of it. We also need to know how far apart the plants need to be spaced and this spacing can vary according to the plants to be used.

CALCULATING AREAS

The calculations needed to be done to find the area measurement, depend on the shape of the flower bed.

1. CALCULATING RECTANGULAR AND SQUARE AREAS

The length and width of the bed must be measured, these are then multiplied together to get the area measurement.

EXAMPLE

LENGTH 4m

WIDTH 1.5m

LENGTH 4 X WIDTH 1.5 = 6m² (The area measurement is shown by the sign m²)

The mathematical name for this calculation is called a FORMULA.

This means that the FORMULA to calculate an Area is Length x Width

A = L x B

You can substitute different measurements for the length and width and this rule will apply for Squares and rectangles.

EXERCISE- Work out the AREA OF THESE FLOWER BEDS

1. 2. 3.

Answer 1............ Answer 2.............................. Answer 3..............................
2. CALCULATING THE AREA OF CIRCLULAR FLOWER BED

The measurement across the circle (going through the centre of the circle) is called the DIAMETER in mathematical terms. From the centre of the circle to the edge is called the RADIUS. (½ the length of the Diameter) It is the Radius measurement that we need to calculate the area of the circle along with another mathematical number that has been found to be the correct number to use when calculating the area of a circle.

This number is referred to as Pi and it’s value is 3.142 (to 3 decimal places) it is also shown in some FORMULAS with the following symbol $\pi$

THE FORMULA TO CALCULATE THE AREA OF A CIRCLE IS $\pi r^2$

$r^2$ means radius measurement $\times$ radius measurement.

EXAMPLE CALCULATION

FORMULA Area Of a Circle = $\pi r^2$

Area = 3.142 $\times$ 3 $\times$ 3

Area = 3.142 $\times$ 9

3.142 $\times$ 9

28.278m²

Sometimes $\pi$ is only used to 2 decimal places 3.14 so the calculation would not be quite as accurate, but it would be accurate enough for garden measurements.

Area = 3.14 $\times$ 3 $\times$ 3

Area = 3.14 $\times$ 9

3.14 $\times$ 9

28.26m²
CALCULATING THE AREA OF AN OVAL FLOWER BED

The **FORMULA** to calculate the area of the oval FLOWER BED is:

\[
\text{AREA} = \pi \times A \times B
\]

This will usually be written like this \( \pi \ A \ B \) (When there are no addition, divide or take away signs between the letters and symbols, the rule is always to multiply them together.)

**EXAMPLE CALCULATION**

\[
\text{AREA} = 3.142 \times 4 \times 2
\]

\[
\text{AREA} = 3.142 \times 8 \quad \text{or (less accurate) } 3.14 \times 8
\]

\[
\frac{25.136 \text{m}^2}{25.12 \text{m}^2}
\]

**EXERCISE.** WORK OUT THE AREA OF THESE FLOWER BEDS:

1. Radius 5.5m

Answer 1..........................  Answer 2..........................  Answer 3..........................
CALCULATING THE AREA OF A TRIANGULAR FLOWER BED
This used the FORMULA for a square or triangle divided by two.

Area of a triangle = \( \frac{1}{2} \) base x height.

The diagrams above fig 1, 2, and 3 show that a triangle is made up of \( \frac{1}{2} \) a rectangle or square.

Using fig 3 The calculation to find the area is as follows:

\[
\text{AREA} = \frac{1}{2} \times 4 \times 3.5 \\
\text{AREA} = \frac{1}{2} \times 14 \text{m}^2 \\
\text{AREA} = 7 \text{m}^2
\]

EXERCISE. CALCULATE THE AREA OF THESE FLOWER BEDS
Area of a triangle = \( \frac{1}{2} \) base x height.

Answer 1………………………… Answer 2………………………… Answer 3…………………………
DIFFERENT SHAPED FLOWER BEDS

Sometimes flower beds are not a standard square, rectangle, triangle, oval or circle. But by using these shapes and dividing the areas up, we can find out the total area of the beds.

Below are some different shapes that you may find you have to plant up. Draw lines across the shapes to make up areas that could be calculated.

Needs to be printed or enter lines on to shapes
CALCULATING THE AREA OF RANDOM SHAPED FLOWER BEDS

To do this the shape of the flower bed should be drawn to scale onto graph or squared paper so that each box will represent the full sized area. The scale used will depend on how big the area is that has to be drawn. Think of a map of the world drawn in an atlas. 1cm on the plan will represent 1000’s miles for the full size it shows. A map of a town drawn on the same size of paper will be able to show much more detail and the scale will be very different. The map of a flower bed will be even more detailed and could show where each plant will be planted.

This is very useful when a flower bed is being planted up with different plants, or different coloured plants.

EXAMPLE EXERCISE
USING SCALE PLANS TO DESIGN FLOWER BEDS

Designing flower beds not only involves using different plants, but also uses colour and height of plants.

Designing the planting plan on graph paper can save both time and money as you can count up the areas of each colour to decide how many plants you will need.

EXAMPLE PLAN

In this plan the garden is small and each square represents a plant, but in bigger planting schemes each square may represent 1 m².

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```

KEY

O RED PETUNIAS
O YELLOW PETUNIAS
X MID BLUE LIBELIA
# WHITE ALYSUM

For these bigger planting schemes it is important to know how many plants will be needed to plant up each m² and this will vary according to how much distance is needed between the plants.
**USING MULTIPLICATION TABLES TO HELP CALCULATE AREA SIZES**

With the help of a multiplication table it is much easier to work out areas.

The table shows numbers along one side and down one side of the grid. By tracing the numbers you want to multiply down and across the grid, it will give you the answer.

**EXAMPLE** - Flower bed  \(7\text{m} \times 8\text{m} = \text{?m}^2\)

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</table>

The table shows that the area would be \(56\text{m}^2\)

Use the table to work out these areas.

1. \(6\text{m} \times 5\text{m}\)  
2. \(9\text{m} \times 10\text{m}\)  
3. \(3\text{m} \times 11\text{m}\)  
4. \(12\text{m} \times 8\text{m}\)  
5. \(7\text{m} \times 4\text{m}\)

1. \(\text{--------}\) 2. \(\text{--------}\) 3. \(\text{--------}\) 4. \(\text{--------}\) 5. \(\text{--------}\)
TABLES USING PART MEASUREMENTS

The multiplication table shows the answers for multiplication of whole numbers, but we often have flower beds that measure in metres and centimetres.

The grid below is showing multiplication of m and 1/2m.

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The grid could also be made up from 1/4m (0.25m) measurements.

Using a calculator, see if you can fill in this grid (some of the numbers will be in the grid above)

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