

FRUIT THINNING MATHS

During the summer it is important to 'thin' out the developing fruitlets – why not make this mathematical?



Thinning is a necessary orchard task which provides a fun and practical application of maths and once the data has been collected it can be used to reinforce any of the mathematics curriculum – the limits are your imagination!

LEARNING OUTCOMES

KS 1 Mathematics

- Solve problems with addition and subtraction
- Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables

KS 2 Mathematics

- Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
- Solve simple measure and money problems involving fractions and decimals to two decimal places
- Identify lines of symmetry in 2-D shapes presented in different orientations

Extension activity links

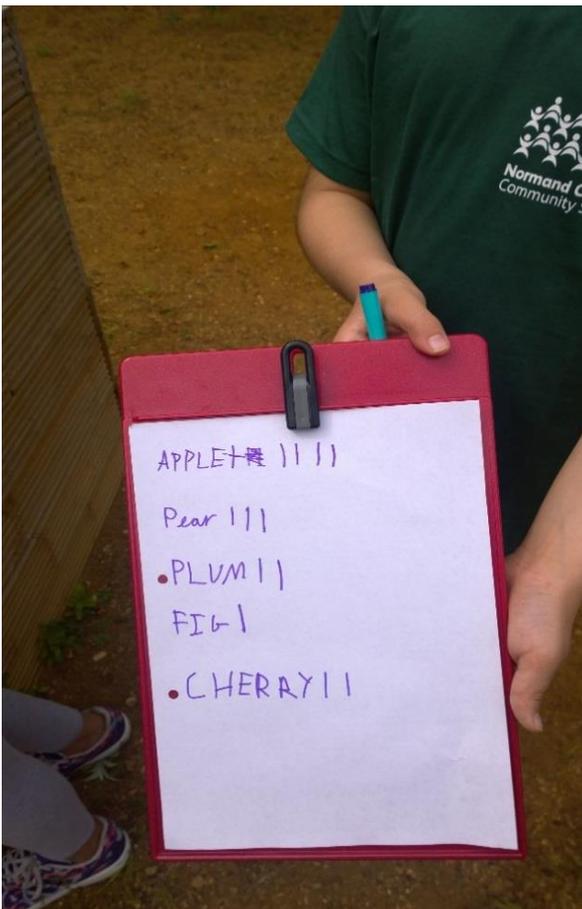
- Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs
- Compare durations of events [for example to calculate the time taken by particular events or tasks].
- Interpret and present data using bar charts, pictograms and tables

- Solve one-step and two-step questions (for example, 'How many more?' and 'How many fewer?') using information presented in scaled bar charts and pictograms and tables.
- Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

RESOURCES

- Clipboards, paper and pencils
- Digital food weighing scales
- Rulers or tape measures
- Pencils
- Secateurs or scissors
- A sharp knife
- A ball of string
- A calculator

INTRODUCTION – FRUIT THINNING (10 MIN)



● What is 'thinning' and why do we do it?

Why would we remove fruit when that's what we want to grow?! What would happen if we left all of the fruit on the tree?

If pollination has been good in the spring, fruit trees may produce large numbers of fruits as more of its flowers have been fertilised. This might sound like a good thing, but it means that the tree has to divide and share its energy and resources out between more fruits, which results in many smaller, poorer quality fruit. As the fruit swells and becomes heavier it may leave young branches deformed or even broken.

In order to get bigger, better quality fruit that are higher in the healthy phytonutrients that keep us healthy, it is necessary to remove some of the fruits while they are still small, so that all the energy from photosynthesis and the water and nutrients sucked up by the roots all go to the remaining fruit.

● Look closely at the fruit on the trees – do they differ in size and appearance?

Are some fruits smaller than others? Are some of them shaded from the sun? Do any of them have any damage on them?

What has damaged this fruit – is anything living inside?!

Can we see any holes or marks on the fruit?

This provides an opportunity to spot any problems with the fruit, for example, you may find holes that indicate the presence of larvae in inside – the classic 'maggot' in the apple! Use the knife to slice one open to see if you can find the culprit! Other common damage is from animals such as squirrels and birds – can you see beak or bite marks? Any damage to the skin may result in the fruit becoming mouldy so it should be removed.

Can you find any lines of symmetry in a full fruit and a fruit sliced in half?

Is a fruit a 2D or 3D shape?

THIN THE FRUIT AND RECORD THE NUMBERS (15 MIN)



Who wants to have a go at thinning?

Now it's time to thin the fruit so that we get nice, big juicy fruit in a few months' time!

Have the children select which fruits should be removed from each branch

NB. If your tree is young and newly planted it is best to remove all of the fruit in the first two summers after planting as this will help the tree divert it's resources to root growth and will prevent thin branches from breaking under the weight of the fruit. After that you can begin to leave more on the tree year on year.

Using the secateurs or scissors, carefully snip the stalks of the smallest and any damaged, deformed or rotting fruits, and those that are unlikely to ripen due to being shaded by leaves, branches or other fruit. Collect them as you go.

Leave only 1-2 apples or pears per cluster, and leave one plum roughly every 10cm along the branch.

How shall we record these numbers?

How many fruits have you removed? How many remain on each tree? How many were damaged by animals?

Count the total number of fruits on each tree and record as tally marks. Use tally marks to count the number removed from each tree. Subtract the picked fruit from the total. Work out how many were damaged by animals etc.

WEIGHING & MEASURING THE FRUIT (15 MIN)

How should we measure the size and weight of the fruit?

What equipment shall we use? What units are appropriate?

Weigh and measure some individual fruits from each tree and then weigh the total amount of thinned fruit from each tree.

What is the average size and weight for an apple, pear and plum?

Find the average length, width and weight of the thinned fruits.

AGE YOUR TREES (10 MIN)

How can we work out the age of a tree?

Why might it be useful to know the age of a fruit tree? With this method, why do we divide by a larger number if the tree is in an open space?

If you know the age of a fruit tree you can work out what sort of yield you can expect it to produce. A tree in an open space has less competition from other trees for light, water and nutrients, and therefore will be larger than a tree of a similar age in a woodland situation. This method only gives an approximate age.

- 1/. Use the string to measure the distance around the trunk – this is known as the 'girth'
 - 2/. Lay the string out flat and measure the girth
 - 3/. Find out how old the tree is by dividing the girth measurement by:
 - **1.25** if your tree is in woodland/surrounded by other trees
 - **2.5** if your tree is in an open space
- *You could round these numbers down to 1 and 2 for lower year groups

TIME TO RECAP (5 MIN)

What have we learned today?

Give two reasons why is it important to thin out the fruits?

What time of the year should we thin the fruits?

What might cause damage to the fruits?

How do you measure the age of a tree?

Shall we come out to the orchard again in a few weeks to observe and measure the fruits to compare?

EXTENSION ACTIVITIES

- Compare the weight of an individual thinning to one of the remaining fruits one month later, and again to a ripe fruit later in the year (what has made the fruit heavier? Water!). Weigh some samples from the thinned fruits and find the average weight. Measure the length and width of some of the thinned fruits. Compare different types of fruit (plum vs apple) and compare with full sized fruits later in the year.
- Compare different types of fruit (plum vs apple) and compare with full sized fruits later in the year.
- How long does it take for the fruit to develop fully and ripen, from fruit set (when you can first see the tiny fruit swell and the blossom petals drop) to harvest time? How does this compare for different types of fruit?