By the end of this lesson the children should be able to: -

- Explain the process of tooth decay.
- Understand the factors that increase the process of dental decay.

Background information

Although the number of children experiencing tooth decay has reduced since the introduction of fluoride toothpaste in the 1970's, alarming numbers are continuing to have fillings or extractions due to decayed teeth.

Although fluoride is effective in helping to reduce the incidence of tooth decay it can only be of maximum benefit in conjunction with a reduction in the frequency of sugar consumption.

In order for tooth decay to occur you need 2 factors.....plaque and sugar.

When sugar enters the mouth it immediately reacts with the plaque and reduces the natural pH level to create plaque acid. When it drops below the pH level of 5.5 the calcium and phosphate salts are released from the tooth enamel. This is called demineralisation.

Demineralisation can last up to an hour depending on how retentive the food is.

Saliva plays a major role in the repair process and neutralises the plaque acid flushing it away as quickly as possible. When all the plaque acid has been removed the saliva helps the repair process by depositing calcium and phosphate salts back into the tooth enamel. This is remineralisation.

Frequency of sugar consumption is vitally important when trying to reduce the incidence of tooth decay. If there are too many episodes of demineralisation the mouth never gets the opportunity to fully recover to the natural pH level of 7 and therefore the teeth are literally bathed in acid all day, resulting in a cavity forming.

In essence the message to get across is it's not how much sugar we consume that affects our teeth, it's the frequency at which we consume it that dictates the incidence of tooth decay.

The most damaging foods and drinks are those which we consume in between meals. These tend to be snacks/drinks which contain sugar for example biscuits, sweets and juice.

Sugar has many different names ie. Sucrose, glucose, dextrose etc. Generally speaking if it ends in "ose" it's sugar! Many manufacturers list the ingredients in products in order of quantity so it's easy to see by looking at labels which foods contain high proportions of sugar.

If these in between meal snacks and drinks were consumed at meal times instead, they would cause less damage to teeth. This is due to the fact we have high levels of saliva present in our mouth at meal times to aid the digestion process therefore, the plaque acid will be flushed away quicker at meal times than it would at other times in the day.

Wherever possible we should actively encourage children to eat healthily. If snacks are needed, promote the healthy eating messages by encouraging them to eat fresh fruit, raw vegetables and savoury snacks. Plain milk and water are the only "safe" drinks which can be consumed at any time throughout the day without affecting the teeth. All other drinks including those of the diet, low sugar and sugar free varieties should be kept to meal times as they contain phosphoric acid and citric acid which can cause tooth erosion and decay.

In summary the main messages are:

1) Reduce the frequency in the consumption of sugar containing foods and drinks.
2) Keep sugary foods and drinks to meal times. Remember there is more saliva in your mouth at this time, which will help to neutralise and flush away any harmful acid.
3) Encourage children to have only one special time in the day when they have sweets, preferably at a meal time rather than eating them on the way to or from school or whilst watching television.
4) Encourage children to choose healthy snacks and drinks in between meals.

Activity/Experiment

Understanding the decay process

Aim

To increase the pupil's awareness about the process of tooth decay.

Objective

By witnessing the decaying process of fruit the pupil will be able to understand the decay process and be able to relate this process to tooth decay.

Resources required

- 5 x clear plastic food bags.
- 5 x different varieties of fruit for example banana, strawberry, apple etc.
- 5 x tie wraps.
- Worksheet.

Method

1) Divide the class into 5 groups
2) Give each group of pupils a piece of fruit, a plastic bag and a tie wrap.
3) Ask the pupils to place the fruit into the bags and tie them up.
4) Give each pupil a worksheet and ask them to fill in the appropriate boxes.
5) Every day for one week ask the pupils to check the physical condition of the fruit and to record their observations onto the worksheet.
6) At the end of the experiment ask the pupils to identify which piece of fruit decayed the quickest and discuss why.

This experiment will simulate the process of decay from a disease-free piece of fruit to a rotting mass representing a healthy tooth, to a decayed tooth.

You will gain a broader range of results if you use a variety of different fruits.

Worksheet - Understanding the decay process

Use the table below to record your observations of your piece of fruit for a week

Name	**Class**

Name of fruit Eg. banana	**Colour** Normal/pale	**Texture** Firm/soft	**Appearance** Normal/wrinkled/ mouldy	**Smell** Normal/offensive
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				
Day 7