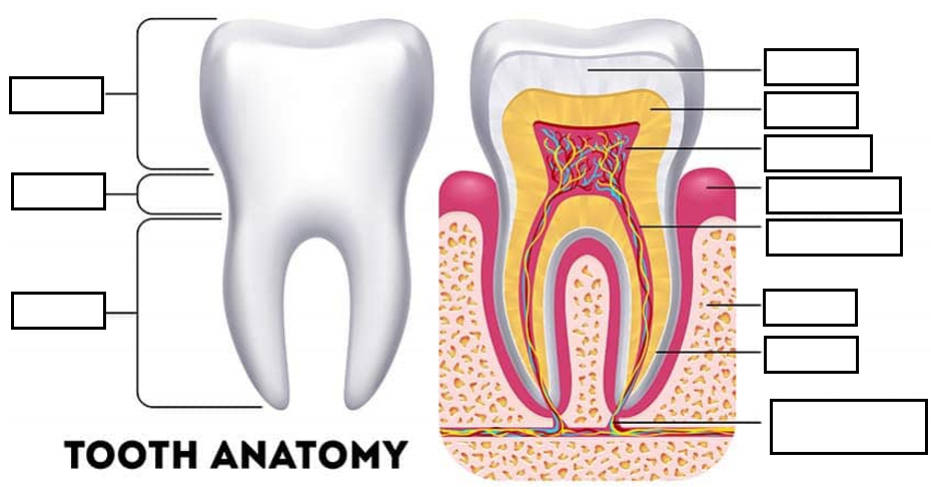


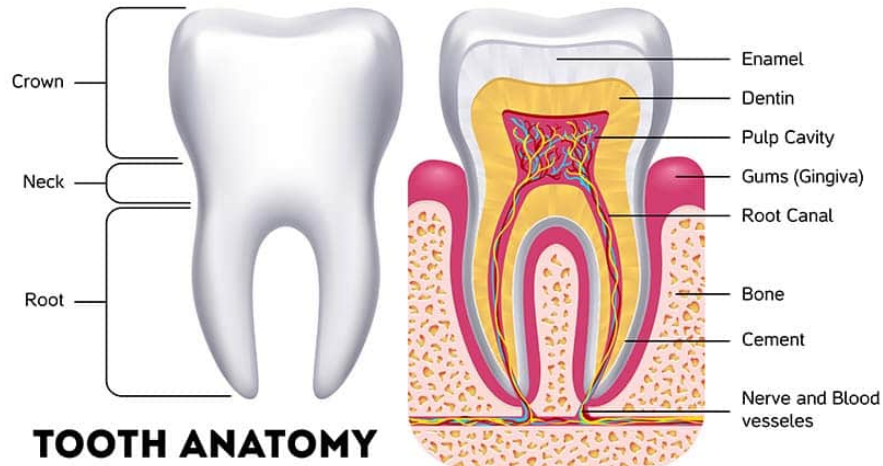
LET'S SHARE A SMILE! (11-14)

Ages 11 to 14 (Level 3)

Description:	Teach your child how to take care of her or his teeth and develop healthy oral hygiene habits
Leading question:	How can we maintain healthy teeth?
Age group:	11 to 14 years
Subjects:	Biology
Total time required:	6.6 hours over 6 days
Self-guided / Supervised activity:	Self-guided (supervision required for knowledge check, some interactions and quiz)
Resources required:	Notebook/paper, pen/pencil, eggs, vinegar, water, soft drink (any), any toothpaste with fluoride (check the label), 4 jars or bottles with cap

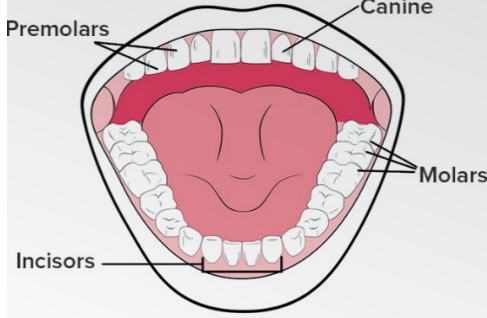
Day	Time	Activity and Description																																
1	20 minutes	<p>Today you will learn about parts of a tooth and good oral hygiene habits</p> <p>The learner will reflect on why she or he thinks teeth are important and write a paragraph on the importance of teeth and what she or he does to keep their teeth healthy (without looking at the table below). They can also think about a time when they hurt their teeth and describe how it felt and what they did to remedy their pain.</p> <p>The learner will then compare his/her list of healthy teeth habits to the activities listed in the table</p> <p style="text-align: center;">healthy teeth observation table</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Activity</th> <th>Monday</th> <th>Tuesday</th> <th>Wednesday</th> <th>Thursday</th> <th>Friday</th> <th>Saturday</th> <th>Sunday</th> </tr> </thead> <tbody> <tr> <td>Brushing teeth twice</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Brushing teeth for 2 to 3 mins</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Avoid Sugary drinks</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Activity	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Brushing teeth twice								Brushing teeth for 2 to 3 mins								Avoid Sugary drinks							
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		and candies							
		Clean tongue (prevents bad breath)							
	10 minutes	The learner will make the table on the next page in his/her notebook. The table needs to be maintained for the whole week. All the activities mentioned in the table are to be done on a daily basis and recorded with a tick mark. These activities are required to maintain good oral hygiene.							
	10 minutes	What do you think the inside of a tooth looks like? The learner will draw the structure of a tooth without looking at the image below.							
	10 minutes	The learner will then look at the image, compare it and then make the required adjustments or draw a new figure as shown on image 1 below in his or her notebook. The learner should use the word bank to attempt to label the diagram of the tooth in their notebook.							
		Once the learner has attempted to label the diagram, they should compare it with the labelled diagram in image 2.							
		Image 1: unlabeled tooth structure							
		 <p>The diagram consists of two parts. On the left is an external view of a tooth with three empty boxes for labeling: one for the crown, one for the neck, and one for the root. On the right is a cross-section of the tooth with eight empty boxes for labeling internal structures: enamel, dentin, pulp chamber, pulp root, pulp space, root canal, root, and alveolar bone.</p> <p style="text-align: center;">TOOTH ANATOMY</p>							

	5 minutes	<p style="text-align: center;">WORD BANK</p> <p>Enamel Neck Root canal Gums Crown Pulp cavity Dentin Bone Cement Root Pulp containing nerves and blood vessels</p>  <p style="text-align: center;">TOOTH ANATOMY</p> <p>Source: https://www.trianglepediatricdentistry.com/all-about-primary-teeth/ image 2: labelled tooth structure</p> <p>Numeracy activity:</p> <ul style="list-style-type: none"> How many parts in the labelled diagram did you get right? Calculate the percentage of right answers. (hint: divide the number of right answers by the total number of parts and multiply the result by 100)
2		Today, the learner will carry out an experiment with the objective of learning about what causes tooth decay and how to prevent it.

10 minutes	The learner will brainstorm and list down in their notebook the foods they think can cause tooth decay along with a brief explanation. The learner will get the answer to this question after the experiment.																														
40 minutes	<p>The learner will get four jars or bottles with caps and pour vinegar in two of them and pour water and soft drink in the other two jars. The learner will coat one egg with fluoride toothpaste and gently drop it in a jar with vinegar. The learner will then gently drop 3 uncoated eggs into jars with vinegar, water and soft drink, making sure that the eggs don't break while dropping them in the jar. The learner will then close the jars and let the eggs stay for 5 days. The learner will note down the condition of the eggshells on each day for a total of 5 days.</p> <p>Note: Eggshells are one of the best substitutes for teeth as they are made up of the same chemicals as the tooth enamel. The learner can choose to add other solutions such as milk, lemonade, tea/coffee for comparison.</p> <p>The learner will copy the table below in their notebook to record any changes to the eggshells every day. The learner should record any changes to the color and/or texture of the eggshells. If there is no change observed, the learner can write "no changes".</p> <p>Note: The learner can add more columns if more solutions are added to the ones mentioned already</p> <p style="text-align: center;">tooth decay experiment table</p> <table border="1" data-bbox="418 1165 1356 1606"> <thead> <tr> <th>DAY</th> <th>JAR WITH VINEGAR</th> <th>JAR WITH WATER</th> <th>JAR WITH ANY SOFT DRINK</th> <th>JAR WITH VINEGAR AND AN EGG COATED WITH TOOTHPASTE</th> </tr> </thead> <tbody> <tr><td>1</td><td></td><td></td><td></td><td></td></tr> <tr><td>2</td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	DAY	JAR WITH VINEGAR	JAR WITH WATER	JAR WITH ANY SOFT DRINK	JAR WITH VINEGAR AND AN EGG COATED WITH TOOTHPASTE	1					2					3					4					5				
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15 minutes	<p>Numeracy activity:</p> <ul style="list-style-type: none"> Let's assume that the uncoated "tooth" in vinegar decays at a rate of 2% per hour, how many days it reaches 100% decay? (Hint: there are 24 hours in a day) 																														

		<ul style="list-style-type: none"> After learning that soda is bad for your teeth, Sami reduced his consumption of soda to 1/5th the previous amount. What fraction of the original amount does he now consume?
3	10 minutes	The learner will record experiment data on the Healthy Teeth Observation table for days 3 to 5 of the program.
	20 minutes	The learner will show the Healthy Teeth checklist every day to the guardian/supervisor to ensure that he/she has followed good oral hygiene habits on the previous day. The learner will also discuss whether he/she has faced any problems while following oral hygiene habits.
	40 minutes	The learner will look at all the eggshells in the four jars and record changes to eggshells in terms of color and texture on the tooth decay experiment table above. The learner will have to watch for the condition of the eggshell coated with toothpaste in the jar with vinegar very carefully as it is important to compare that with the condition of the uncoated eggshell in the vinegar jar.
	40 minutes	The learner will think about the importance of a healthy smile and how it can positively impact others. The learner will smile at strangers, neighbors, friends and family, and observe and record their reactions. They will use their observations from this experiment to write an essay or a paragraph in response to the following prompt: "does smiling improve happiness?"
4	10 minutes	The learner will show the Healthy Teeth checklist every day to the guardian/supervisor to ensure that he/she has followed good oral hygiene habits on the previous day. The learner will also discuss whether he/she has faced any problems while following oral hygiene habits.
	20 minutes	The learner will look at all the eggshells in the four jars and record changes to eggshells in terms of color and texture on the tooth decay experiment table above. The learner will have to watch for the condition of the eggshell coated with toothpaste in the jar with vinegar very carefully as it is important to compare that with the condition of the uncoated eggshell in the vinegar jar.
	40 minutes	The learner will learn about different types of teeth and their functions: <ul style="list-style-type: none"> The learner will examine their mouth and identify the different types of teeth they have and draw them in a smiling mouth The chisel-shaped front teeth are called incisors; the sharper teeth on either side of incisors with one pointy tip (or cusp) are called canines; the teeth that come after canines and have two points or cusps are called premolars; the wider back teeth with four or five points/cusps are called molars.

		 <p>Source: https://www.smileinla.com/four-different-types-of-teeth-their-function/</p> <ul style="list-style-type: none"> The learner will then think about the different roles different teeth play. He or she will eat an apple or any other item and observe the process and the different roles teeth play The learner can also look at the appendix for more details The learner will create a table or list detailing the function of each tooth type in the process of eating 															
5	<p>10 minutes</p> <p>20 minutes</p> <p>15 minutes</p> <p>20 minutes</p>	<p>The learner will show the Healthy Teeth checklist every day to the guardian/supervisor to ensure that he/she has followed good oral hygiene habits on the previous day. The learner will also discuss whether he/she has faced any problems while following oral hygiene habits.</p> <p>The learner will look at all the eggshells in the four jars and record changes to eggshells in terms of color and texture on the tooth decay experiment table above. The learner will have to watch for the condition of the eggshell coated with toothpaste in the jar with vinegar very carefully as it is important to compare that with the condition of the uncoated eggshell in the vinegar jar.</p> <p>The learner will think about how animals use different teeth and how teeth functions differ depending on whether animals are herbivores (plant eaters), carnivores (meat eaters), or omnivores (plant and meat eaters).</p> <p>Learner will then compare the functions of some teeth in humans with animals</p> <table border="1" data-bbox="418 1453 1351 1711"> <thead> <tr> <th>Function</th> <th>Human tooth</th> <th>Animal tooth</th> </tr> </thead> <tbody> <tr> <td>Cut food (first bite)</td> <td></td> <td></td> </tr> <tr> <td>Tear through meat</td> <td></td> <td></td> </tr> <tr> <td>Tear and grind food</td> <td>e.g. premolars</td> <td>e.g. tearing and chewing soft food (or toys in dogs)</td> </tr> <tr> <td>Crush and grind food</td> <td></td> <td></td> </tr> </tbody> </table> <p>On day 5 (or 6), the learner will review healthy teeth observation table and discuss with a family member:</p>	Function	Human tooth	Animal tooth	Cut food (first bite)			Tear through meat			Tear and grind food	e.g. premolars	e.g. tearing and chewing soft food (or toys in dogs)	Crush and grind food		
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		<ul style="list-style-type: none"> • What percentage of the healthy practices listed has the learner followed each day? • Has the learner adopted more or less healthy practices as the days went by? Or is there no pattern? Why do you observe this? • How easy or difficult were the healthy teeth practices to follow, and why?
6	40 minutes	<p>Today you will complete the experiment on tooth decay</p> <p>The learner will remove the eggs from the jar and note down the final condition of each eggshell in the four jars in the tooth decay experiment table.</p> <p>What can you conclude from this experiment? How do coated and uncoated eggs compare? What can you say about the effect of different fluids on our teeth? The learner will note down the observations and conclusions in his or her notebook</p> <p>The learner should write down in his/her notebook what he/she thinks caused the changes in the condition of the eggshells soaked in vinegar and soft drinks.</p> <p>Explanation:</p> <ul style="list-style-type: none"> • The learner will observe that the eggshells in vinegar and soft drink will be affected the most. There will be cracks and holes on the surface or the surface may be completely damaged. The eggshells in water and milk (if used) will remain unaffected. The eggshell coated with fluoride toothpaste will be less affected than the uncoated egg in the jar with vinegar. Eggshell soaked in coffee/tea (if used) will show brown/yellow stains. • If the learner is unable to understand, the guardian/supervisor can explain that the bacteria in our mouth convert sugary foods into acids. These acids dissolve the tooth enamel resulting in holes in the tooth which are called cavities. Vinegar contains acetic acid and soft drinks contain phosphoric acid which cause the damage to the eggshells. The egg coated with fluoride toothpaste is less affected as fluoride is good for preventing tooth decay. • The learner should be able to appreciate that even though the egg was coated with fluoride toothpaste, there was still some damage that was observed. Hence, we should avoid sugary drinks in addition to brushing teeth twice daily. The more sugar we consume, the more acid gets produced which leads to tooth decay. On the other hand, foods like carrots, apples and cucumbers have a cleansing effect on teeth and hence are good for teeth.
	30 minutes	<p>The learner will produce a creative flipbook, poster, or manual serving as the “how-to” guide for healthy teeth that must answer the following questions in one paragraph or more:</p> <ul style="list-style-type: none"> • How many teeth do adults have? What are the different types of teeth adults have? • Why are teeth important from a health and social perspective?





	<ul style="list-style-type: none"> • What are three steps we can take to maintain healthy teeth? • What foods or habits must be limited or avoided to maintain healthy teeth? <p>The learner will share the guide with his or her family.</p>
Assessment Criteria:	<ul style="list-style-type: none"> - Understanding parts of a tooth - Successful completion of quiz - Successful completion of daily checklist activities - Understanding of good oral hygiene habits - Understanding causes of tooth decay and how to prevent it

Learning outcomes:	<ul style="list-style-type: none"> - Structure of tooth - Good oral hygiene habits - Good and bad foods for teeth - What causes tooth decay - How to prevent tooth decay
Required previous learning:	N/a
Inspiration:	N/a
Additional enrichment activities:	<p>The learner can take this short quiz to test his/her knowledge of tooth health. The guardian/supervisor can dictate the questions to the learner and the learner will have 20 minutes to answer 10 questions. The guardian/supervisor can use the answer key to check the answers (or the learner can do it themselves):</p> <p>Healthy teeth quiz</p> <ol style="list-style-type: none"> 1. Name two things you can do to avoid getting cavities 2. How many times in a day should you brush your teeth? 3. Name two foods that cause tooth cavities 4. Why do we use toothpaste to brush teeth? 5. How long should you brush your teeth? 6. What hard, tough substance covers the crown of the tooth? 7. Choose the correct answer What part of the tooth does dentin protect? <ol style="list-style-type: none"> a. Gum b. Root c. Pulp d. Crown 8. What does pulp contain? 9. Which doctor checks our teeth? 10. How often should we see a tooth doctor? <p>Answer key</p> <ol style="list-style-type: none"> 1. Brushing your teeth regularly and avoiding sugary food/drinks 2. Twice daily (in the morning and before going to bed)

	<ol style="list-style-type: none"> 3. Soft drinks, sugar candies 4. Fluoride in toothpaste helps prevent tooth cavities 5. You should spend 2-3 mins each time you brush 6. Enamel 7. c. Pulp 8. Pulp contains nerves and blood vessels 9. Dentists are doctors of teeth 10. At least once in a year <p>Share your results and what you have learned about maintaining healthy teeth with your family. You may also quiz them on healthy teeth using the quiz you just completed!</p>
<p>Modifications for simplification:</p>	<p>- Learners can reduce the number of tasks and activities in this project and only conduct the main experiment with egg shells and track the healthy teeth habits of their family members.</p>

MODIFICATIONS FOR SIMPLIFICATION

Types of human teeth

	Incisor	Canine	Premolar	Molar
				
Position in mouth	Front	Either side of incisors	Behind canine	Back
Description	Chisel-shaped (sharp edge)	Slightly more pointed than incisors	2 points (cusps), 1 or 2 roots	4 or 5 cusps 2 or 3 roots
Function	Biting of pieces of food	Similar function to incisors	Tearing and grinding food	Chewing and grinding food

Source: <https://biology-igcse.weebly.com/human-teeth-and-dental-decay.html>