**Science Week**

**Year 4** Lesson plan.

|  |  |  |
| --- | --- | --- |
| Year group: Year 4 | Linked career: **Dentist** | Innovation: Toothpaste |
| Previous learning:‘Animals including humans’* Describe the simple functions of the basic parts of the digestive system in humans.
 | NC objective this lesson covers:‘Animals including humans’* Identify the different types of teeth in humans and their simple functions
 | Future learning:‘Animals including humans’* Construct and interpret a variety of food chains, identifying produces, predators and prey.
 |
| Subject knowledge:(See accompanying sheets)* Decay: to rot or decompose through the action of bacteria.
* Micro-organisms are present in our mouths. Bacteria, acid, food, debris and saliva combine in the mouth to form a sticky, colourless film called plaque.
* Plaque not removed from teeth becomes a hard substance called tartar. The acid in plaque can dissolve the enamel surface of the tooth and create holes (cavities). Untreated cavities can cause tooth loss.
* Brushing the teeth and gums are very important.
 | Working Scientifically and enquiry types:

|  |  |
| --- | --- |
| Enquiry Skills | Working Scientifically |
|  | Observation: | Screen Clipping | Observing |
|  | Identifying and classifying: | Screen Clipping | Making predictions |
|  | Testing: | Screen Clipping | Setting up tests |
|  | Research: | Screen Clipping | Asking questions |
| Screen Clipping | Pattern Seeking | Screen Clipping | Recording data |
|  | Screen Clipping | Interpreting and communicating results |
| Screen Clipping | Evaluating |

 | Key vocabulary:**Animals including human’s unit**- Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, incisor, canine, herbivore, omnivore.**This session**- mouth, teeth, saliva, fluoride, taste, plaque, removal, foaming, hygiene, decay, bacteria, cavity, gum disease, tartar.  |
| Previous learning or linked learning to this unit: |
| Objective | Suggested learning (Resources can be found on Plymouth Science website for the complete unit) |
| * Describe the simple functions of the basic parts of the digestive system in humans.
 | Recap the skeletal system (Year 3). Human digestive system drama, model of the digestive system ending with poo! |
| * Identify the different types of teeth in humans and their simple functions.
 | Observation of teeth in mouths and look or patterns. Identification and classification of different teeth, function of teeth practical activity. |
| * Construct and interpret a variety of food chains, identifying producers, predators and prey.
 | Compare animals teeth, classify into omnivore, herbivore and carnivore. Identifying animal food chains through animal poo dissection! Linked to book ‘The story of the little mole who knew it was none of their business’. Children make poo based on a chosen animal. Identify food chains linked to energy source, class food web, outdoor lesson linked to habitats and their food source.  |
| British Science Week lesson |
| Sequence of learning. +WS | Suggested activities linked to the NC objective ‘Identify the different types of teeth in humans and their simple functions.’ | You will need: |
| 1. Lesson 1

2. 3.  | 1. What do we know so far quiz- revision of year 3 objectives1. Watch dentist video who sets the task for the session ‘to create your own toothpaste’. Children to then discuss what skills a dentist may need to do their job, remind them of their skills passports.
2. Critical thinking: Children to think about what causes teeth to decay. Focus on the word ‘decay’ – What does this mean? (PowerPoint Slide 10) (5 mins)

Screen Clipping4. Curious and Create: Egg experiment: (PowerPoint Slide 11). You will need to leave this experiment and allow children to observe over at least three days to a week. (Ensure you boil the eggs first – more effective and less messy!)* Children to set up test in groups using ‘post it note approach’ and make predictions based on what they already know (Follow Slides) (15 minute for planning stage
* Remind children about the task set by the dentist (Slide 15)
* Explain to children the history of toothpaste and how this has developed and been ‘innovated’ through the years. (3 mins)
* Allow children to watch the film about toothpaste testers. (3 mins)
* Children look at the toothpaste and ingredients and predict which one will be best and give reasons why. You could photocopy packaging or look at the tube – Can children spot common ingredients?
* Give children all three toothpastes and explain to them that they will be testing to see what the best toothpaste is.
* Explore the word ‘best’ – does this mean best taste, best texture, best foaming or an average of all? (5 mins)
* Allow children to carry out the test, measuring each of the aspects (texture, foaming, taste, plaque removal, smell).
* **The smell test:** how do they rate the smell of each toothpaste (1-5).
* **The abrasive test/plaque removal:** Children time how long it takes to get permanent marker off an egg shell.
* **The Consistency Test:** Put some toothpaste on a brush and children shake the brush until the toothpaste comes off.
* **The Foaming Test:** Use an electric whisk and record how much foam is created.
* **The Taste Test:** Children to rate the taste of their toothpaste (1-5)
* Children use a star rating to rate each toothpaste (40 mins)
* Children will use their results to make recommendations back to the dentist – this could be a poster, an advertisement, letter, report or video (30-90 minutes)

Innovation stageSlide 29- concept cartoon, ask children who they agree with and why?Consider and Connect: Make own toothpaste based on the findings of the above. Children need to use what they know about toothpaste to make one of their own. -Remind children about the key functions of toothpaste (5 mins)-Share concept cartoon- ask children what they think. (2 mins)-Share with children the list of ingredients linked to the ‘what’s in a toothpaste’ slide. Explain to children that only commercial toothpastes contain fluoride. (3 mins)-Share the standard recipe for toothpaste, children to make one of these and add own flavour and adjust from this one. Children must Screen Clippingmeasure and record what goes into each sample. Teacher model and demonstrate with recording (10 mins)Screen Clipping-Children make one toothpaste and test this one again using a star chart to evaluate. Children to think about what they like/dislike and adjust accordingly for toothpaste 2 e.g. less salt, different flavourings. (10-15 mins)-Children continue to test and evaluate until they come up with their chosen toothpaste. (40-60 mins)-Children could think about the following:A name for their toothpasteAn advertising sloganPackaging(30-60 mins) Screen ClippingChildren then think about how they present their findings back to the dentist. E.g. mood board, video, pictures, power point, letter. * Ensure children answer the design brief ‘innovate their own toothpaste to appeal to children’. (30-90 mins)
 | * Eggs
* Jars or glasses
* Water
* Tea/Coffee
* Coke
* Vinegar
* Magnifying glasses
* Toothpaste x 3 varieties
* Recording sheet
* PowerPoint

\*There is also a talk through PowerPoint if teaching this virtually. Screen Clipping |
| Screen ClippingBritish Science Week competition:Poster competition: Your poster needs to be on ‘Innovating the future’. Inspiration can come from anywhere. These lessons or their own innovation. Entries need to be submitted by 30th April via the British Science Week online entry form. [Poster competition - British Science Week](https://www.britishscienceweek.org/plan-your-activities/poster-competition/)What are they looking for?-Creativity in approach- creative interpretation of the theme.-Content- clear, accurate and informative about a STEM topic. -Effective communication- presented and communicated in an engaging wayThere will be one winner in each category. 2 runners up will go on Facebook vote to win. There are prizes to be won. (See website for full rules)Poem: come up with an acrostic poem for INNOVATION, what comes to mind when you hear it? You could turn your poem into a jingle share on The British Association Twitter-@ScienceWeekUk use hashtag #BSW21.Crest Award- this encourages young people to think and behave like scientists and engineers. Children complete 8 activities to achieve a Star or SuperStar Award which includes a certificate and badge. Library.crestawards.org | British Science Week: Innovating the future ‘I’m a scientist’ activity. Head to imascientist.org.uk for further details. Sign up. Click ‘Meet the Scientists’ in the menu bar and read through some of the scientists’ profiles. Prepare 2-3 questions for the scientist in your chat. Sign on at the time for that scientist (see website), click chat at the top of the page to join the session. Ask your questions and chat to a scientist- they’re excited to answer your questions!Sciencelive.netScreen ClippingInspiringthefuture.org- helpful ideas for using volunteers. | Plymouth City Council/ Plymouth Science Hub:Send us your work, photos, videos, research on scientists who have made life changing innovations.Prizes to be won.1. Find out about a scientist who has innovated something- make a gallery in your school. Send us a copy which we can display on our website Plymouth Science.
2. Send us your videos/posters as we are running our own competition where prizes can be won.
3. You could feature on our website or on the Great Science Share website.

All entries to be sent to plymouthscienceteam@gmail.comVisit our website for all resources under ‘Careers Related Learning’ Plymouthsciencehub.co.ukYou can sign up for FREE, all resources are FREE.Plymouth City Council - YouTube |



