Toothpaste

Summary

Age category
6 - 8 years
Topic
Data & Statistics
Measurement
Numbers & operations
Total duration
450 minutes

Students discuss ideas about oral hygiene. They answer a questionnaire and analyse data. They produce their own toothpaste with herbs.

Problem(s) to be tackled:

- Is our oral hygiene correct?
- How can we improve our oral hygiene habits?
- How can we make toothpaste?

Real context

Oral cavities are a non-contagious disease especially common amongst kids because of different food and oral hygiene habits. It’s necessary to improve proper dental hygiene habits.

Goals

Skills

Domain-general

- Communicating (organising an awareness campaign)
- Planning (defining a strategy to create a solution (e.g. an awareness campaign))

Mathematics:

- Recording and analysing data with a table and/or graph
- Measuring quantities
- Recognizing and using mathematical forms of expression to discuss, reason and give an account of texts, questions, conclusions, ... (e.g. percentage)

Sciences:

- Carrying out small-scale research in daily life
- Collecting, analysing and interpreting data systematically
- Discovering properties of ingredients (e.g. taste)

Technology - Engineering:

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- Identifying and analysing technological solutions (toothpaste) based on their appropriateness and function
- Experiencing that certain products are made conform certain technical principles and determinig what the function is of each separate ingredient
- Drawing a design for a certain solution (packaging toothpaste)
- Making, using, evaluating and optimizing a technical solution (toothpaste)

Knowledge

Mathematics:

- Numbers and operations: percentage
- Measurements: quantities
- Data and Statistics: table, graph

Sciences:

- Teeth and mouth.
- Oral hygiene.
- Plants and their properties.

Technology - Engineering:

- Measurement and measuring instruments.
- Transformation of materials.

Methodology

Part	Description	Timing
1	**Challenge: Teacher's introduction** ***The teacher introduces the context of the activity: Tooth cavities*** Students analyse a cartoon and news.	45'
2	**Questionnaire (individual): group work and group discussion** ***Questionnaire and construction of tables and graphs*** Students answer a questionnaire about oral hygiene (can be found in the template for students in the investigate part). Each group collects and analyses one of the class answers in tables and graphs in order to analyse (e.g. paper, Excel, etc.). Discussion in group of the results and suggestions for improving oral hygiene habits.	180'

3	**Small group work / laboratory activity** Here, you have the choice: **Version A** **Toothpaste activity (small groups): group work** Small groups analyse the recipe *"Let's make toothpaste"* on the worksheet and exploitation of the medicinal properties of each of the components to be used in the toothpaste. **Laboratory activity (small groups)** *"Let's make toothpaste"* **Version B** **Research (small groups): group work** *Groups research on web, in books, with families "How to make toothpaste?"* and explore the medicinal properties of each of the components to be used in the toothpaste. Discussion in the class group to choose the best way of producing toothpaste. **Laboratory activity (small groups)** *"Let's make toothpaste"*	135-180'
4	**Suggestions for extension** ***Songs***– Dynamise songs in the class group about oral hygiene. Portuguese - https://www.youtube.com/watch?v=q7HgnoSH3QA English - https://www.youtube.com/watch?v=lnHIgRhJctc - https://www.youtube.com/watch?v=Ku-ForS6G3I&t=29s ***Books*** **-** Read a book about teeth, mouth and oral hygiene habits, for example, while making the infusion. ***Bookmarks and posters*** – Construction of bookmarks and posters about oral hygiene in the class group to give to the school community. ***Packaging and logo*** – Construct packaging and logo for the toothpaste in small groups.	45-90'

5	**Final assessment: group discussion** The final assessment is carried out in small groups and looks at the way they worked together and individually and how each one enriched the team's work.	45'

Organization

Materials

- Computer and internet
- Books
- Writing material, rulers
- Paper worksheets
- Material for the group laboratory activity

Printables

Worksheet Toothpaste

Grouping

Groups should be organised according to students' abilities, maths and manual skills.

Coaching

Useful questions

Engage, #1

- What do you think about what the kids are saying?

- What are the causes of tooth cavities?

- What kind of care should we take to prevent oral diseases?

- Why do you think there are so many kids with tooth cavities?

Investigate and Conclude, #2

- What's the answer given most frequently in each question?

- Are you brushing your teeth enough times per day?

- Why should we avoid eating sweets between meals?

- Why should we go to the dentist frequently?

- What is the best way of keeping our mouth healthy?

Plan, Investigate and Create, #3

- How do we make toothpaste?

- What kind of herbs can we use in our toothpaste? Why?

- How many other materials do we need? How do we know the right quantities?

The questions will depend on the laboratory activity and the students' difficulties in carrying out the laboratory activity confidently.

Extension, #4

- How can we sensitise the school community to the need to maintain good oral hygiene?

- What kind of packaging and logo can we use for our toothpaste?

Report, #5

- How did the group work?

- How did you contribute to the group work?

- What were the greatest difficulties that your group faced?

- How did the group overcome the difficulties?

Assessment

Teacher's assessment:

- Schedule adequate
- Students motivation and participation
- Group collaboration
- All groups carried out the laboratory activity as planned
- Cooperation of the whole class

Students' assessment:

- Group work
- Individual contribution to the work
- All tasks completed on time
- Greatest difficulties
- Ways to overcome the difficulties

Tips & tricks

- You can/should change the second text in the student timesheet for another one that refers to your country.
- The recipe presented is an example that can be changed for another of your preference.
- You can have an awareness-raising meeting with families about the problems of oral hygiene and the impact on global health.
- You can invite the chemistry teacher to explain safety rules in the lab.
- You can invite older students to participate in the laboratory activity of making toothpaste.
- You can ask the local dentist to be your partner on this project by giving you some materials or monitoring oral health.
- You can make the toothpaste with "informal" measures like a spoon, drop, etc., or if you have older students, you can change it to milligrams and millilitres.
- You should prepare some materials: dynamometers, water heater, strainer, herbs, essential oils, kaolin, food

colouring, etc.

- Repeat the questionnaire with all students after a month to check if there have been changes to oral hygiene habits.
- You can compare the results of the questionnaire with students from other classes, schools or even countries.