

Activity Support Document

How much water do we waste?

Introduction

This activity has been designed to make pupils realise how much water they are wasting. Pupils will carry out a practical activity where they recreate cleaning their teeth and measure the water wasted during this daily task. It is primarily aimed at 5 to 7 year old pupils, but it could be extended to older pupils by getting them to design the investigation and extending the calculations.

This activity has been created for use by teachers and/or Environment Agency STEM Ambassadors and is part of a series on water which also includes:

- ✓ **A water working wall**
- ✓ **The water cycle**
- ✓ **What's my job?**

These activities enable teachers to introduce the work of the Environment Agency into their lessons and deliver elements of the National Curriculum with the help of an Environment Agency STEM Ambassador if one is available.

Topic | Water

-  **User** Teacher
-  **Age group** Ages 4 - 11
-  **Length of activity** 60 mins
-  **Subjects** Science, Geography

At the end of this activity pupils should be able to do the following:

- ✓ Measure a volume of water accurately
- ✓ State how often people should clean their teeth
- ✓ Explain why it is important that people clean their teeth
- ✓ Select appropriate equipment to measure different volumes of water
- ✓ Make a prediction about how much water comes from a tap running at different rates
- ✓ Calculate how much water is wasted in a week when brushing teeth
- ✓ Explain why water should not be wasted

> What is the activity about and how to organise it?

This is meant as a guide to running the activity, but please feel free to adapt it to suit your particular requirements.

If an Environment Agency STEM Ambassador is available contact them in advance and check how involved they want to be with running the activity.

It may be that they wish to run the whole activity themselves with your help or alternatively they may not feel confident doing this and would prefer to assist pupils with their predictions, measurements and calculations. In either case, ask the STEM Ambassador to provide an image of themselves in their work clothes to insert into slide 13. Use this slide at the start of the presentation so the STEM Ambassador can introduce themselves to the pupils.

The powerpoint presentation shows the full structure of the activity and there are guidance notes for some slides. Images and ideas from this activity can be added to the water working wall if you have created one.

In advance of the activity it is recommended that the volume of water that comes from the tap to be used is measured to ensure that sufficient buckets and bottles are available to measure the water coming from the fully open tap.

Part 1 – Introducing the importance of teeth brushing and how water is wasted

This part of the activity introduces the idea that water can be wasted and that water is wasted when we brush our teeth. Slide 1 asks pupils to think about how much water they waste and slide 2 highlights to pupils why we need to brush our teeth and how often it needs to be done. Slide 3 asks the question how long we should brush our teeth for. The answer is 2 minutes, twice a day.

Part 2 – Measuring how much water is wasted when we brush our teeth for 2 minutes

Slide 5 asks a pupil to act out brushing their teeth. Emphasise what they do with the tap. Then introduce the experiment in slide 6 to measure how much water is wasted in 2 minutes when a tap is:

- Turned on and off during the tooth brushing session
- Dripping water during the tooth brushing session
- Gently running water
- Open fully so the water comes out as fast as possible

Ask pupils to predict how much water might come out of each tap and complete it on their results sheet (see slide 10). Then get pupils to think about what they could use to measure this volume of water. Slide 9 introduces how the pupils will do the experiment. The activity needs the pupils to have access to a tap, and could be done in a classroom or outside. NOTE: Do a risk assessment of the area in which the children are undertaking this activity.

Explain to the pupils that they are going to walk on the spot stopping and starting as the tap is turned on and off to rinse their toothbrush. This stopping and starting can be controlled by the teacher/STEM Ambassador.



A pair of children collect the water that comes from the tap in this time and then measure its volume. Next get the pupils to slowly lift one leg then the other for two minutes, like a dripping tap, whilst a pair of children collect the water from the dripping tap and then measure the volume after 2 minutes. Next get the pupils to walk on the spot for two minutes, like a gently running tap, whilst a pair of children collect the water from the gently running tap and then measure the volume after 2 minutes.

Next get the pupils to run on the spot for two minutes, like a fast flowing tap, whilst a pair of children collect the water from the fast flowing tap and then measure the volume after 2 minutes. After each 2 minute session get the pupils to record the volumes of water collected in their results table (slide 10) and discuss how it compares with their predictions. Slide 11 then asks pupils to calculate how much water would be wasted for each water flow rate from a tap in a day and then a week.

Plenary

Slide 12 introduces a group discussion activity to get pupils to think again about the ways that water is wasted and how they might be able to reduce the volume of water they waste. Also discuss why it is important water is not wasted. Choose a few pupils to share their ideas with the whole class.

Support

Some pupils may need support with measuring the volume of water collected. They could just measure it in full litres, using 1 litre empty drinks bottles and a funnel to pour it into them. For younger pupils the calculations may be too challenging so get them to represent the volume by saying how many litre bottles it might be. They may also find it difficult to understand why we must not waste water. Show them a picture of a desert to give them the idea that fresh water is precious.

Extension

Older pupils could be asked to design their own experiment to calculate how much water is wasted when we brush our teeth. Also, the calculations on slide 11 could be continued by asking the pupils to calculate how much they waste daily themselves, in their family, in the class, in the whole school, during a week, month, year etc.

> Key words

water
millilitres

litres
predict

time
minutes

volume
speed

teeth
toothbrush

> Equipment needed for session

- | | | | |
|--|---|---|---|
|  | Powerpoint slides and accompanying notes
Prepare slide 13 with STEM Ambassador details (if required) |  | Buckets to collect water and measure |
|  | Timer |  | Litre bottles x 10 |
|  | Easily accessible cold water running tap |  | Funnels (if needed) |
|  | Measuring jugs to collect and measure |  | Worksheets for each pair of students |
| | | | • Predictions and results • Calculations |

> Where does this fit into the National Curriculum?

EYFS

- Learn about how to take care of themselves

Science - Year 2

- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene
- Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- Working scientifically – gather and record data to help in answering questions

Science – Years 3 and 4

- Working scientifically – making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment

Science – Years 5 and 6

- Working scientifically – taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

Geography-Key Stage 2 Human and physical geography

- Describe and understand key aspects of physical geography, including the water cycle

Cross curricular links

Mathematics

- Measuring the volume of water used in each two minute period. Calculating how much might be wasted in a day, week, month, year etc.

English

- Create a poster or comic strip to encourage people to not waste water or how to clean their teeth using a minimum amount of water

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Resource sheet 1

Predictions and results (2 tables per A4 sheet)

Table for pupils to record their predictions and measurements for the volume of water collected from the taps with different water flows.

Water flow	Predicted volume of water to be collected in 2 minutes	Actual volume of water collected in two minutes
Turning tap on/off		
Drip		
Gentle running		
Rapidly flowing		

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Drip		
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Resource sheet 2

Calculations (2 tables per A4 sheet)

Use this table to record your measurements for how much water flows from each tap in two minutes and then calculate the daily and weekly volumes.

The volume of water collected in 2 minutes for each tap represents how much water is possibly wasted when we brush our teeth.

Water flow	Volume collected in 2 minutes	Volume wasted brushing our teeth twice a day (2 times a day x 2mins)	Volume wasted brushing our teeth twice a day (daily volume x 7 days)
Turning tap on/off			
Drip			
Gentle running			
Rapidly flowing			

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