



**British
Antarctic Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

WALRUS FROM SPACE

TEACHER ACTIVITY GUIDE FOR AGES 7-12



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INTRODUCTION

At WWF and British Antarctic Survey (BAS) we are asking teachers and students to become 'Walrus Detectives' and help contribute to conservation science by searching for walrus in thousands of satellite images taken from space!

The WWF and BAS 'Walrus from Space' project aims to carry out a census of Atlantic and Laptev walrus populations over five years, which will help scientists to spot changes over time. We want teachers and students to help by searching for walrus in the thousands of images that will be gathered by satellites. All you need is access to a computer or tablet and an internet connection to take part.



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WHY WALRUS?

The climate crisis is having a significant impact on the Arctic, with this polar region warming almost three times faster than the global average. Walrus rely on sea ice, but the warming world is melting the ice from beneath them. Resting on land rather than on the sea ice can force walrus to swim further and expend more energy to reach their food and reduces the region that they can search.

At the same time the Arctic Ocean is becoming more acidic as it absorbs carbon dioxide, making it difficult for animals like clams, sea snails and crabs – the main prey of walrus – to build their shells.

Walrus can also be disturbed by shipping traffic and industrial development as the Arctic becomes more accessible to such activities when sea ice is lost.

As the Arctic is a vast and changing place, we simply don't know enough yet about how many walrus there are, the trends in their population and how the climate crisis is affecting them. Without having a full picture of the situation, we can't track the impact of these changes on walrus, or understand how we can help to safeguard their future.

Our collective actions add up to something powerful, and we want to involve half a million people over the next 4 years to help review the images collected every year and search for walrus. The information gathered with the help of the public, coupled with the knowledge of other research groups and local and Indigenous communities of the Arctic, will be crucial to our conservation efforts.



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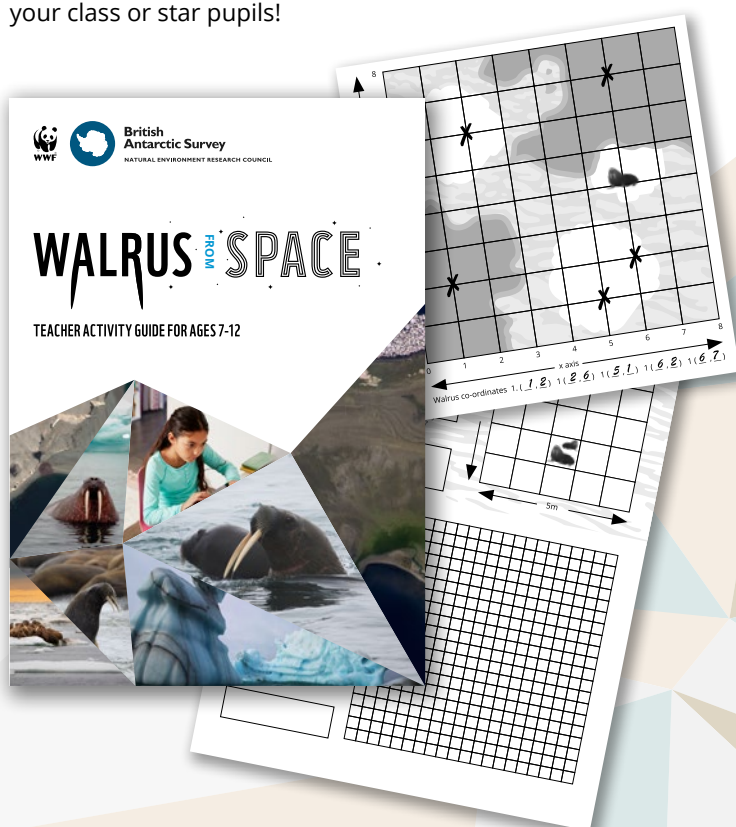


WHAT'S IN THIS GUIDE?

This teacher guide provides simple activity ideas based on the topics of walrus and climate change as well as instructions on how students can become 'Walrus Detectives'. You could use these activities as part of a specific module on climate change or polar climates or as part of related topics in science, geography and maths subjects (see page 4 for curriculum links).

We recommend that you use our **'Walrus from Space' class presentation** in a lesson or assembly before running these activities with your students.

Once you've completed one of our activities make sure to download your **Walrus Detective certificate** for your class or star pupils!



ACTIVITIES

- 1 Walrus Detectives – sign up on our Walrus from Space platform to search through satellite images of the Arctic from space!
- 2 Where's Walrus? – use co-ordinates to search for walrus in the Arctic
- 3 Arctic Maths – explore the Arctic ice through our maths worksheet
- 4 Investigation: Sea Ice – design a science experiment to explore how climate change impacts the Arctic sea ice.
- 5 Walrus Detective Certificate – make sure to download our Walrus Detectives certificate for your class or star pupils!

SUSTAINABLE DEVELOPMENT GOALS

Walrus from Space links with the Sustainable Development Goals, in particular the following three goals:



CURRICULUM LINKS

ENGLAND

Geography: Human and physical geography: describe and understand key aspects of: climate zones, biomes, land use and the distribution of natural resources including energy, food, minerals and water.

Locational knowledge: identify the position and significance of Arctic and Antarctic Circle

Geographical skills and fieldwork: use maps, atlases, globes and digital/computer mapping to locate countries and describe features studied, use four and six-figure grid references to build their knowledge of the United Kingdom and the wider world

Science: Living things and their habitats: recognise that environments can change and that this can sometimes pose dangers to living things.

Animals including humans: identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat, construct and interpret a variety of food chains, identifying producers, predators and prey.

States of matter: observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)

Working scientifically: gathering, recording, classifying and presenting data in a variety of ways to help in answering questions, making systematic and careful observations, identifying differences, similarities or changes related to simple scientific ideas and processes

Mathematics: Number: estimate numbers using different representations, solve problems, including missing number problems, involving multiplication and division

Statistics: interpret and present data using bar charts, pictograms and tables

SCOTLAND

Sciences: Planet Earth: I can identify and classify examples of living things, past and present, to help me appreciate their diversity. I can relate physical and behavioural characteristics to their survival or extinction. **SCN 2-01a**

I can use my knowledge of the interactions and energy flow between plants and animals in ecosystems, food chains and webs **SCN 2-02a**

Materials By contributing to investigations into familiar changes in substances to produce other substances, I can describe how their characteristics have changed. **SCN 2-15a**

Topical Science: I can report and comment on current scientific news items to develop my knowledge and understanding of topical science. **SCN 2-20b**

Social studies: People, place & environment: I can discuss the environmental impact of human activity and suggest ways in which we can live in a more environmentally- responsible way. **SOC 2-08a**

By comparing my local area with a contrasting area outwith Britain, I can investigate the main features of weather and climate, discussing the impact on living things. **SOC 2-12a**

Numeracy: I can use my knowledge of rounding to routinely estimate the answer to a problem, then after calculating, decide if my answer is reasonable, sharing my solution with others. **MNU 2-01a**

Having determined which calculations are needed, I can solve problems involving whole numbers using a range of methods, sharing my approaches and solutions with others. **MNU 2-03a**

Information handling: I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables, charts, diagrams and graphs, making effective use of technology. **MTH 2-21a / MTH 3-21a**

WALES

Geography: Understanding places, environments and processes: identify and describe natural and human features, identify similarities and differences to describe, compare and contrast places and environments, describe the causes and consequences of how places and environments change, e.g. by season; from past to present; the need for sustainability.

Range: Living in my world: caring for places and environments and the importance of being a global citizen

Science

Interdependence of organisms: the interdependence of living organisms in two environments and their representation as food chains, the environmental factors that affect what grows and lives in two environments, e.g. sunlight, water availability, temperature, how humans affect the local environment, e.g. litter, water, pollution, noise pollution.

Make careful observations and accurate measurements, using digital and ICT equipment at times

Mathematics

Using number skills: use number facts and relationships, calculate using mental and written methods

Using measuring skills: Temperature, area and volume

Using data skills: Collect and record data, present and analyse data, interpret results

NORTHERN IRELAND

The World Around Us: Interdependence: how living things rely on each other within the natural world; the effect of people on the natural and built environment over time

Place: ways in which people, plants and animals depend on the features and materials in places and how they adapt to their environment; features of, and variations in places, including physical, human, climatic, vegetation and animal life; positive and negative effects of natural and human events upon a place over time

Change over time: how change is a feature of the human and natural world and may have consequences for our lives and the world around us; ways in which change occurs over both short and long periods of time in the physical and natural world; The effects of positive and negative changes globally and how we contribute to some of these changes.

Movement and Energy: causes that affect the movement of people and animals; how movement can be accelerated by human and natural events such as wars, earthquakes, famine or floods.

Mathematics and numeracy

Number: develop an understanding of place value to include up to two decimal places, use this to multiply and divide numbers by 10 and 100 estimate and approximate to gain an indication of the size of a solution to a calculation or problem

Measures: develop skills in estimation of area, calculate perimeter and the areas of simple shapes

Handling data: collect, classify, record and present data drawn from a range of meaningful situations, using graphs, tables, diagrams and ICT software

ACTIVITY 1:

WALRUS DETECTIVES



To help us search for walrus in satellite images you and your students will need access to a computer or tablet with a connection to the internet.

The minimum recommended age for participating in the activity without adult supervision is 10 years old, so we recommend that teachers sign up for their own account on the Walrus from Space platform and then let students use this account to search through the satellite images while supervised. We would suggest that you do this during a lesson alongside running one of our other Walrus from Space activities.

WALRUS FROM SPACE INTRODUCTION VIDEO:

<https://youtu.be/qTg5oircxrw>



HOW TO START?

1. To start you will need to create an account by signing up to the platform here geohive.maxar.com/walrus
2. You will be asked to take a short tutorial on how to identify walrus in satellite images
3. Once you've completed the tutorial you and your students can get searching through the satellite imagery to become Walrus Detectives!
4. Achieve digital badges by searching through satellite images and remember to download our Walrus Detectives certificate!



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ACTIVITY 2:

WHERE'S WALRUS?

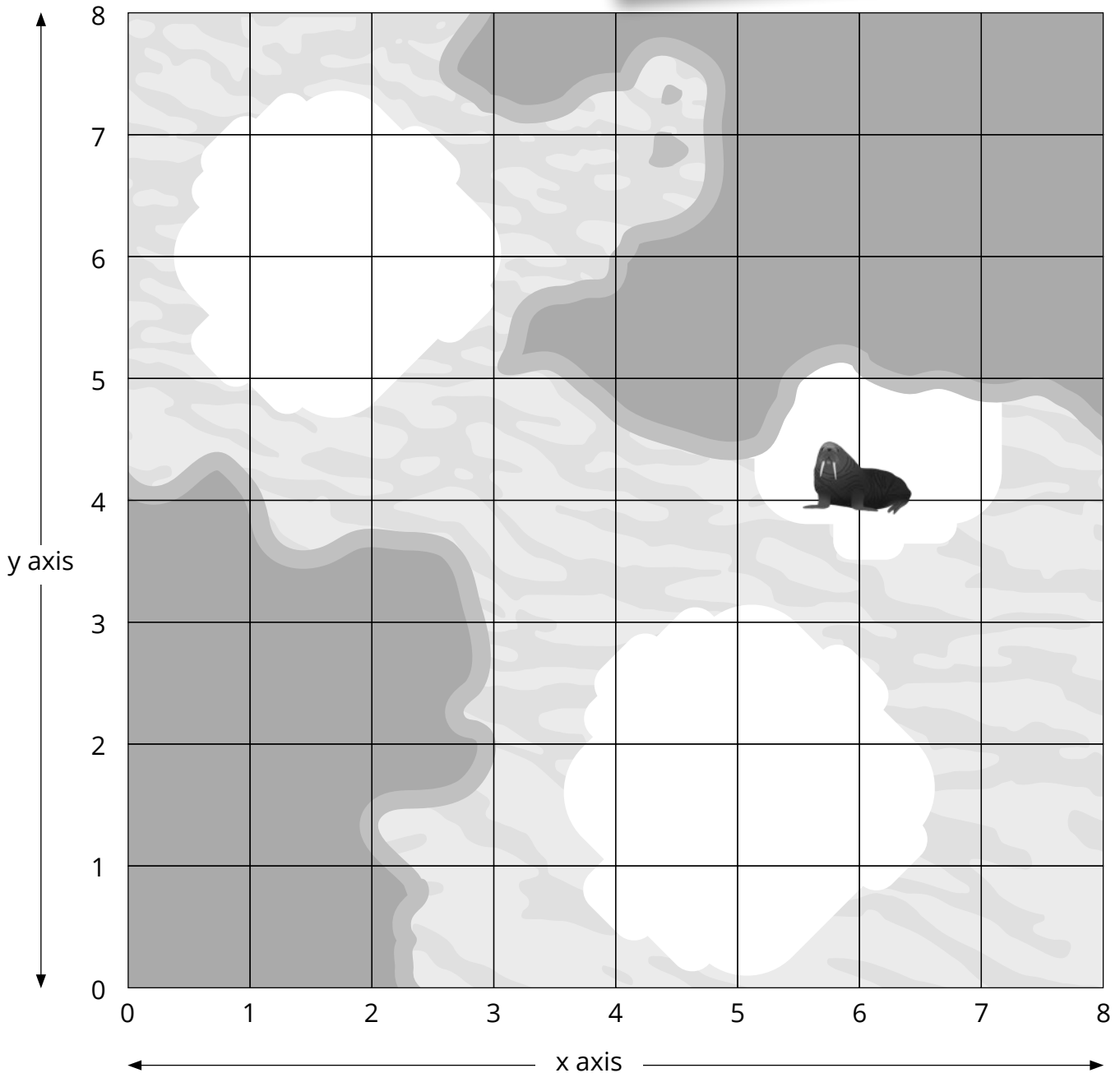
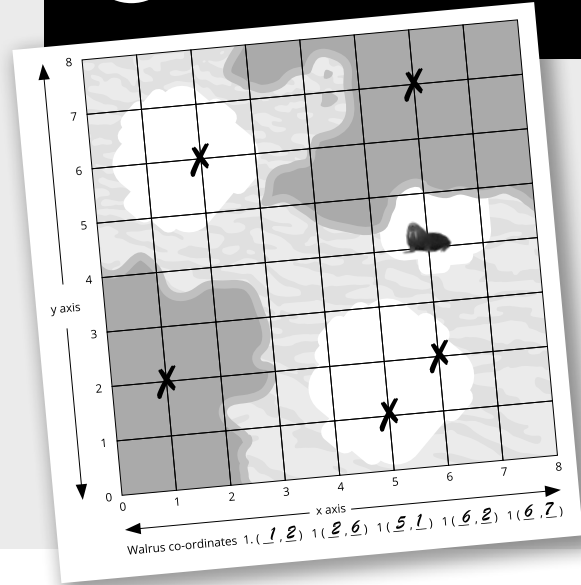


15
minutes



Pair
activity

1. Using the grid below, choose four points to place your walrus.
2. Plot them on the grid with an X or with a token.
3. In the space below write the co-ordinates for your walrus (remember when writing pairs of co-ordinates, the x axis comes first, then the y axis)
4. Use co-ordinates to guess where your partner's walrus are located.
5. First to find all of the walrus, wins!



Walrus co-ordinates 1 (6 , 4) 2 (,) 3 (,) 4 (,) 5 (,)

ACTIVITY 3:

ARCTIC MATHS



20 minutes



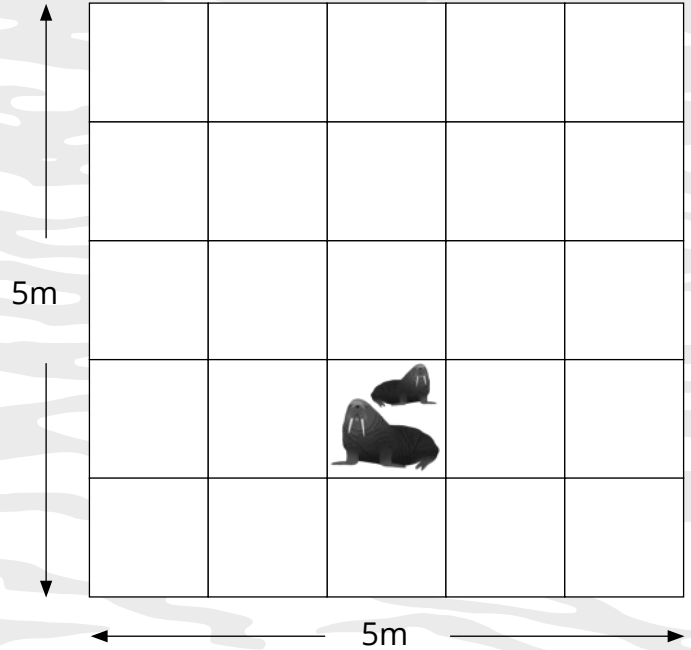
Individual activity

1. What is the **perimeter** of the sea ice?

2. What is the **area** of the sea ice?

3. If two walrus can fit in each grid square, how many walrus could fit onto this area of sea ice in total?

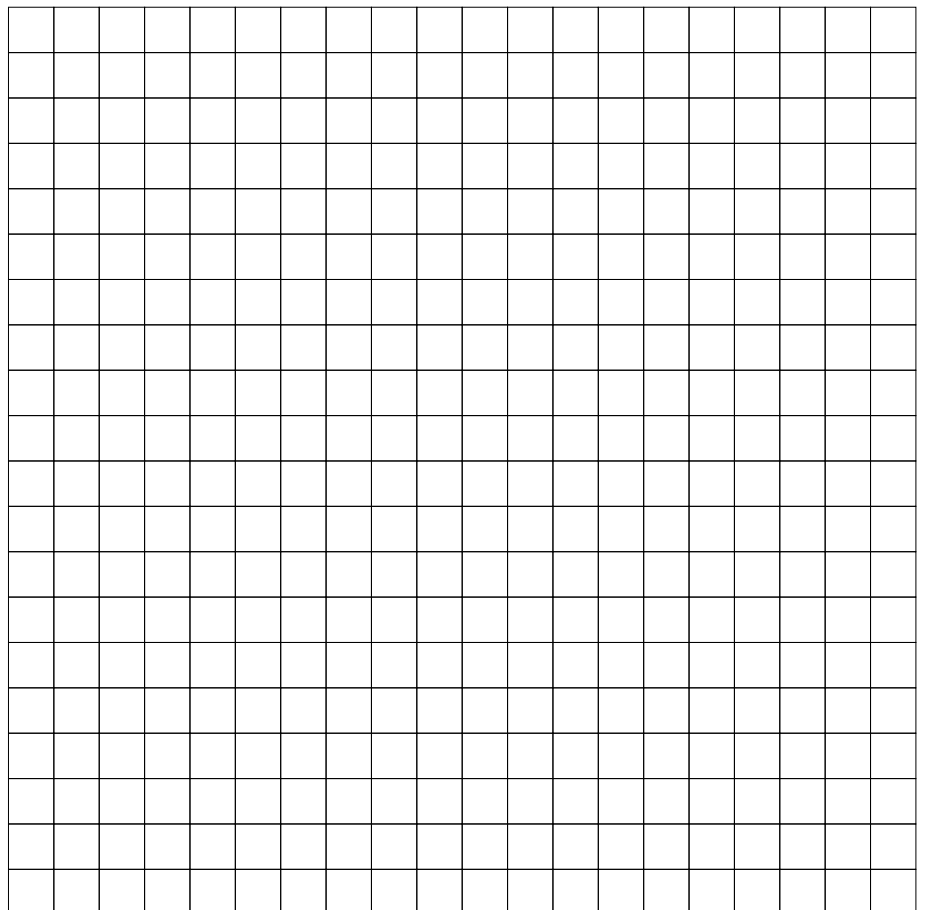
SEA ICE ↓



Plot a graph to show how the Arctic sea ice has changed over the last 10 years. Make sure to label your axes.



Over the past 40 years has the Arctic sea ice been increasing or decreasing on average?



ACTIVITY 4:

INVESTIGATION: SEA ICE



2 single
lessons or 1
double lesson



Work in
pairs or
small groups

Walrus rely on sea ice, but the warming world is melting the ice from beneath them.

Use the planning sheet below to conduct your own science investigation into melting sea ice.

Question. What do you want to find out about melting sea ice?

Variable. What one thing are you going to change?

Controls. What will you need to keep the same so that your experiment is a fair test?

Hypothesis, what do you predict will happen?

What **equipment** will you need for your experiment?

Method. How will you set up your experiment?

Step 1...

Results. Use this space to record your results

Display your results. Use this space to show your results (this could be as a bar chart, a line graph, a drawing...)

What happened in your experiment? Why do you think this happened?

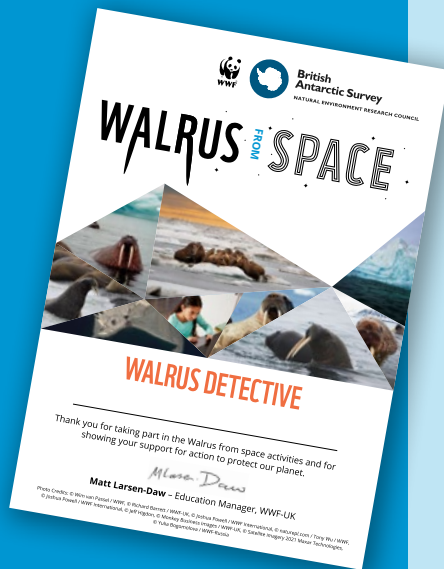
WALRUS DETECTIVE CERTIFICATE

If you have taken part in Walrus from Space and/or run one of our Walrus from Space class activities, you can download a Walrus Detective certificate for your class!

Step 1: Run the 'Walrus from Space' presentation as a lesson or assembly

Step 2: Take part in at least one of the suggested activities (or come up with your own!)

Step 3: Tell us which activities you've taken part in as a school and download your certificate!



WHAT NEXT?

- Sign up to our teacher newsletter
<https://www.wwf.org.uk/get-involved/schools>
- Use our Introduction to Climate Change resources
<https://www.wwf.org.uk/get-involved/schools/resources/climate-change-resources>
- Use our Shaping Our Future climate resources
<https://www.wwf.org.uk/get-involved/schools/school-campaigns/shaping-our-future>
- Take part in Earth Hour
<https://www.wwf.org.uk/get-involved/schools/school-campaigns/earth-hour-schools>
- Sign up for a WWF Live Lesson or webinar for your class
<https://www.wwf.org.uk/get-involved/schools/calendar>



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