The Climate Survey

The Climate Survey includes four activities:

- **Activity 1**: Are aircraft making clouds?
- **Activity 2**: How do winds blow the clouds?
- **Activity 3**: What do birds do with the clouds?
- **Activity 4**: How are weather conditions affecting your environment?

**About the Climate Survey**

The Climate Survey includes:

- **Activity 1**: Are aircraft making clouds? Look for contrails, which are visible by day and by night.
- **Activity 2**: How do winds blow the clouds? Use a meteor to measure cloud motion.
- **Activity 3**: What do birds do with the clouds? Use balloons to measure wind speed and direction.
- **Activity 4**: How are weather conditions affecting your environment? Use a camera or the cloud mirror.

**Introduction**

What impact might we have on the climate, and how good are we at adapting to climate change? The next four fun activities will help us understand how we influence the climate and how the climate affects us. Firstly, we look at contrails, the tracks left in the sky by aircraft, which may be adding to extra-urban warming.

Then we'll investigate how the environment around us changes the flow of air near the ground. We will also explore how climate influences what we can do, such as people from the south-west facing more comfortable air temperatures than those from the north-east, for example?

**Safe fieldwork**

- **1.** Look out directly to the sun, or at the sun through a camera or the cloud mirror.
- **2.** Activity 2 involves running around; keep well away from roads and other busy areas.
- **3.** Take a mobile phone with you in case of emergencies.

**OPAL Climate Survey activities involve contrails, clouds, wind, and thermal comfort outdoors.**

**The survey starts here**

**Activity 1: Are aircraft making clouds?**

The aim of the activity is to spot contrails from high-flying aircraft.

- **Activity 1** involves aircraft making clouds?
- **Activity 2** involves looking for contrails in the sky.
- **Activity 3** involves seeing how cloud motion.
- **Activity 4** involves doing the bird with the clouds?

**What do birds do with the clouds?**

- **Birds** eat the clouds (not exactly!)
- **Clouds** are formed from water droplets or ice crystals.
- **Why do birds do this?**
  - **Birds** eat the clouds (not exactly!)
  - **Clouds** are formed from water droplets or ice crystals.
- **What do birds do with the clouds?**
  - **Birds** eat the clouds (not exactly!)
  - **Clouds** are formed from water droplets or ice crystals.
- **Where can we see them?**
  - **Birds** eat the clouds (not exactly!)
  - **Clouds** are formed from water droplets or ice crystals.
- **How do clouds form?**
  - **Birds** eat the clouds (not exactly!)
  - **Clouds** are formed from water droplets or ice crystals.
- **Why are contrails visible?**
  - **Birds** eat the clouds (not exactly!)
  - **Clouds** are formed from water droplets or ice crystals.
- **What is the climate?**
  - **Birds** eat the clouds (not exactly!)
  - **Clouds** are formed from water droplets or ice crystals.

**Activities 2, 3 and 4 start here**

**Activities 2, 3 and 4 should be done together if possible. Use page 6 in the Workbook to record your observations.**

**End of Activity 1**

- **Activities 2 and 4 should be done together if possible. Use page 6 in the Workbook to record your observation.**

**Activities 2, 3 and 4 should be done together if possible. Use page 6 in the Workbook to record your observation.**
The Climate Survey

The Climate Survey includes four activities.

- Activity 1: Are aircraft making clouds?
  - Aim: To spot contrails from high-flying aircraft.
  - Instructions:
    1. Look out directly into the sun, or in the sky through a camera or the cloud/mirror.
    2. Activity 4 involves running around; keep well away from roads and other busy areas.
    3. Take hold of your phone if you are in emergencies.

- Activity 2: Do the contrails move at person height?
  - Aim: To observe how contrails are affected by different wind speeds.
  - Instructions:
    1. Fix your eyes on a good cloud area.
    2. Watch it blow at person height.

- Activity 3: Are the contrails moving in the sky?
  - Aim: To observe how contrails are affected by different wind speeds.
  - Instructions:
    1. Look at the sky area around, then look at the Cloud Guide in your pack to tell the difference between low, medium, and high cloud types.

- Activity 4: How do the contrails behave when they are taken from an aircraft?
  - Aim: To observe how contrails are affected by different wind speeds.
  - Instructions:
    1. Fix your eyes on a good cloud area.
    2. Watch it blow at person height.


The survey starts here

The aim of the activity is to spot contrails from high-flying aircraft.

You will need page 5 of the Workbook.

- Activity 1: Are aircraft making clouds?
  - Aim: To spot contrails from high-flying aircraft.
  - Instructions:
    1. Look out directly into the sun, or in the sky through a camera or the cloud/mirror.
    2. Activity 4 involves running around; keep well away from roads and other busy areas.
    3. Take hold of your phone if you are in emergencies.

- Activity 2: Do the contrails move at person height?
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  - Aim: To observe how contrails are affected by different wind speeds.
  - Instructions:
    1. Fix your eyes on a good cloud area.
    2. Watch it blow at person height.
The OPAL Climate Survey

The Climate Survey includes 4 activities:

• Activity 1: Are aircraft making clouds? Look for contrails from high-flying aircraft.
• Activity 2: Use a mirror to measure cloud motion. Look at clouds with your good eye.
• Activity 3: How do winds blow the clouds? How do winds blow at person height? Use bubbles to measure wind speed and direction.
• Activity 4: How hot or cold are you now? Compare levels of personal warmth across the country.

Activities 2, 3 and 4 should be done together if possible. Use page 6 in the Workbook to record your observations.

The Climate Survey includes activities involving clouds, contrails, wind and thermal comfort outdoors. It is important to have page 5 of the Workbook.

Safe fieldwork

• Don’t look directly into the sun or at the sun through a camera or the cloud mirror.
• Activity 2 involves running around, keep well away from roads and other busy areas.
• Take a mobile phone with you in case of emergencies.

The survey starts here

Activity 1: Are aircraft making clouds?

The aim of the activity is to spot contrails from high-flying aircraft.

You will need page 5 of the Workbook.

1 Go outside somewhere you can see the sky – the more of the sky you can see the better – on a sunny day. As for Tuesdays and Thursdays in particular, so that we can get some good days with no contrails.
2 Look at the sky around you, then look at the Cloud Guide in your pack to tell the difference between low, medium, and high cloud types.
3 Is the sky covered, or nearly covered, by low or medium cloud?
4 If so, set the wheel Ø for overcast on page 5 of the Workbook.
5 If you can see some good areas of blue sky or high clouds, then have a good look for any contrails.
6 Look at the photographs opposite and note which best describes the contrails you can see. A, B, C, or D does not describe what contrail type you recorded it as.
7 Remember – report contrails if they are anywhere in the sky, they don’t have to be directly overhead.
8 Don’t use page 5 of the Workbook.

The Climate Survey has a Climate Guide with a note of what contrail type you recorded it as (i.e. A, B, C or D). Selected photographs will be used on the website.

End of Activity 1

Activities 2, 3 and 4 start here

• B Dense low-rise 1 to 5 floors
• C Dense mid-rise 3 to 10 floors
• D Dense high-rise more than 10 floors
• F Well spaced barns
• G Seasoning bun
• H Well spaced high-rise
• I Well spaced trees or tall shrubs

Dense (A-C): The buildings are closely packed together with little open space between them.
Well spaced (D-F): The area between buildings is greater than the height of the buildings themselves. This is typical of open space that is greater than the lot built out, this would also be well spaced.
Activities 2, 3 and 4 should be done together if possible. Use page 6 in the Workbook to record your location and the time and date when you start. Then look at your local environment. Which of the categories shown below most closely matches your surroundings? In this centre of a large urban park, you would be in Type I (well-spaced trees), but a few streets away might be Type B (dense mid-rise). Which category do you think best describes your environment?

Activities 2, 3 and 4 start here

Activities 2, 3 and 4 should be done together if possible. Use page 6 in the Workbook to record your location and the time and date when you start. Then look at your local environment. Which of the categories shown below most closely matches your surroundings? In this centre of a large urban park, you would be in Type I (well-spaced trees), but a few streets away might be Type B (dense mid-rise). Which category do you think best describes your environment?

Activities 2, 3 and 4 should be done together if possible. Use page 6 in the Workbook to record your location and the time and date when you start. Then look at your local environment. Which of the categories shown below most closely matches your surroundings? In this centre of a large urban park, you would be in Type I (well-spaced trees), but a few streets away might be Type B (dense mid-rise). Which category do you think best describes your environment?
How hot or cold do you feel?

The activities of the OPAL climate survey tell us about aspects of weather and climate that cannot be measured accurately by standard methods. By putting this new information together we will be able to use it to understand how weather and climate interact.

Activity 4

Global climate change is predicted to result in hotter, wetter and hotter summers across the UK. The survey seeks to shine a light on how the changing climate is affecting people. People in different parts of the UK may be experiencing different climates, and we may need to adapt to different forms of weather and climate.

What is a climate model?

In Activity 1, 2 and 3 we compare your results with weather models to create a picture of climate. To forecast the weather for the next few days, we use models that are very elaborate and use very complex equations. These models can forecast the weather for the next few days, but they do not have any idea of how the weather is influenced by changes in climate. The survey indicates that some people feel the weather is changing in ways that are not predicted by the computer models (see box) used to forecast weather.

Activity 1

In Activity 2 and 3 estimate wind direction at two locations, and compare with weather models. These measurements can be compared with each other, and with weather models to help us understand how the weather and climate interact. By putting this new information together we will be able to use it to understand how weather and climate interact.

Activity 3

Activity 4 is about how weather, climate and local environment affect how hot or cold people feel.

If you haven’t already done so, please note the time, date, location and describe your local environment by answering questions 1-6 on page 8 of the Workbook.

Please don’t try to estimate a wind direction if the wind is blowing downwind or the wind is not blowing at all. If you are a group, you can compare your results with your group members, and the OPAL Climate Survey will compare with other people.

The survey ends here.

Departments

Geography

Robert Gough (OPAL Climate Survey coordinator)

Field Studies Council

www.field-studies-council.org

The activities of the OPAL climate survey tell us about aspects of weather and climate that cannot be measured accurately by standard methods. By putting this new information together we will be able to use it to understand how weather and climate interact.

Activity 4

The survey ends here.

For more information on how to respond to the survey, please visit the OPAL Climate Survey website at www.field-studies-council.org.
How do winds affect you as a person height? 

Bubbles race to measure wind speed

Try to place yourself in this ‘bowler’ to blow bubbles and a ‘timer’ to time them using a stopwatch or watch.

1. Blow a bubble and allow it to float somewhere you can clearly see it. 
2. Blow another bubble and time how long it takes the bubble to reach the finishing line. 
3. Repeat steps 2 and 3 five times. 
4. Measure how long it takes the bubble to reach the finishing line.

An optional activity: you can download a blank chart on the back of the workbook to pack in your own weather pack so you can use the clothes you are wearing to represent the weather conditions you experienced. 

This will give you the average wind direction, speed and direction at ‘person’ height, using soap bubbles. You will need a bubble blowing kit (see page 4 of the Workbook), something to time the blowing of the bubbles (e.g. a stopwatch or watch) and a plastic mirror. Mark the four main compass points on the compass (on page 6 of the Workbook). 

Activity 2:

Bubbles rise to meet the clouds?

This Activity will measure the direction in which the wind is blowing, taking into account how high it is above the ground.

In Activities 1 and 3 we will measure the wind direction and speed at ‘person’ height, using soap bubbles. 

For this Activity you will need to have spent at least 15 minutes outdoors observing the weather and keeping a record of your own observations. This will help you to compare your results with your group members, and see how your results change over time. 

As an optional activity you can download materials from www.OPALexplorenature.org 

Global climate change is predicted to result in colder winters and hotter summers across the UK. This, combined with the human footprint on the environment by answering questions 1-6 on page 6 of the Workbook. 

The survey ends here

Activities 2 and 3 

Activity 3: A bubble race with a timer

The survey ends here

Activities 1 and 3

You will need to have spent at least 15 minutes outdoors observing the weather and keeping a record of your own observations. This will help you to compare your results with your group members, and see how your results change over time. To have confidence in what we are able to use it to better understand how it alters the speed and direction of the wind at ground level.

How will your results be used?

The survey ends here

Activities 1 and 3

This Activity will measure the direction in which the wind is blowing, taking into account how high it is above the ground.

In Activities 1 and 3 we will measure the wind direction and speed at ‘person’ height, using soap bubbles. 

For this Activity you will need to have spent at least 15 minutes outdoors observing the weather and keeping a record of your own observations. This will help you to compare your results with your group members, and see how your results change over time. As an optional activity you can download materials from www.OPALexplorenature.org 

Global climate change is predicted to result in colder winters and hotter summers across the UK. This, combined with the human footprint...
Activity 2: How do you measure the wind? How hot or cold is the air at your start point? When you line up the time on your watch, the wind direction you are facing is the wind direction at your start location.

1. Blow some bubbles and place a marker at your starting position.
2. Blowing at your start position, time the release of the bubble and where it lands. Repeat this for at least five minutes.
3. Choose an area of open ground, a safe distance from any buildings or trees so that the wind is not affected. Keep the compass so that it is pointing north. Position the bubble in your pack (not in your pocket) flat on the floor. Continue to follow the instructions on page 6 of the Workbook.

Bubble chase to measure wind speed

1. Place a marker at your start location.
2. Blow some bubbles and place a marker to follow.
3. Time how long it takes for the bubble to travel from your start position to the marker and repeat.
4. Repeat the above for five bubbles and record your data in the workbook.

Wind direction: remember the direction in which the bubble is moving.

The survey ends here
Activity 2: How do winds blow the clouds?

In this activity, we will measure the direction in which the clouds are moving, which tells us the wind direction at the height of the clouds. To do this, you make an instrument known as a cloud玫瑰 (or cloud mirror) from a mirror and a compass.

- Make the cloud mirror. Included in the pack is a plastic mirror. Make the four main compass directions on the mirror so that the 'N' on the mirror is lined up with the north of your pack. Place the mirror flat on a firm surface. You could also tape it in place at the corner of mirror and a compass.

- Find an outdoor location where you can sit comfortably and where you can sit for at least five minutes.

- Place the cloud mirror so that the compass scale is level with your horizon (the horizon is where the sky meets the earth).

- If you haven’t already done so, note the time, date, location and describe your local environment by answering questions 1-6 on page 6 of the Workbook.

Tips on cloud tracking

- Clouds change their shape and even break up as they travel so it can be difficult to identify a stable feature. Larger features tend to be more stable. A couple of practices will help.

- Watch the clouds for a while to get a sense of the shape that they will be. This will help you to see if one cloud looks like another.

- Follow the cloud feature and repeatedly mark it on the mirror until you have drawn a clear track. The cloud should roughly form a straight line.

- Try to do all still during the tracking. If the wind is strong, put the cloud mirror (the top of a building or a help you keep your hand in the same place.

- The direction from which the clouds come is the wind direction at cloud height.

- Record this as one of the four main directions on this page (or use a small cloud玫瑰 from page 6 of the Workbook). Something to time the bubble (a watch or a stopwatch) and a marker.

- Choose an area of open ground, a safe distance from roads or private property.

- If you haven’t already done so, please note the time, date, location and describe your local environment by answering questions 1-6 on page 6 of the Workbook.

- Place a marker at your starting point, which is where the wind is blowing from.

- Blow some bubbles and collect your data. The bubble will move in the same direction as the wind.

- Record the wind direction on page 6 of the Workbook.

- Look for different wind directions and describe the weather through your window.

Bubble chase to measure wind speed

- Place a marker at your start location.

- Blow some bubbles and collect your data.

- Bubble漂浮, without getting it into the wind, until your eyes or arms are comfortable.

- Blow another bubble and follow the same direction and record the time, date, location and describe your local environment by answering questions 1-6 on page 6 of the Workbook.

- Repeat steps 1 and 2 for five times.

- Bubble漂浮, without getting it into the wind, until your eyes or arms are comfortable.

- Blow another bubble and follow the same direction and record the time, date, location and describe your local environment by answering questions 1-6 on page 6 of the Workbook.

- Repeat steps 1 and 2 for five times.

- Bubble漂浮, without getting it into the wind, until your eyes or arms are comfortable.

- Blow another bubble and follow the same direction and record the time, date, location and describe your local environment by answering questions 1-6 on page 6 of the Workbook.

- Repeat steps 1 and 2 for five times.

- Bubble漂浮, without getting it into the wind, until your eyes or arms are comfortable.

- Blow another bubble and follow the same direction and record the time, date, location and describe your local environment by answering questions 1-6 on page 6 of the Workbook.

- Repeat steps 1 and 2 for five times.

Bubble race to measure wind speed

This activity is about how weather, climate and local environment affect how fast and how cold people feel.

- If you haven’t already done so, please note the time, date, location and describe your local environment by answering questions 1-6 on page 6 of the Workbook.

- Blow some bubbles and collect your data.

- Bubble漂浮, without getting it into the wind, until your eyes or arms are comfortable.

- Blow another bubble and follow the same direction and record the time, date, location and describe your local environment by answering questions 1-6 on page 6 of the Workbook.

- Repeat steps 1 and 2 for five times.

- Bubble漂浮, without getting it into the wind, until your eyes or arms are comfortable.

- Blow another bubble and follow the same direction and record the time, date, location and describe your local environment by answering questions 1-6 on page 6 of the Workbook.

- Repeat steps 1 and 2 for five times.

- Bubble漂浮, without getting it into the wind, until your eyes or arms are comfortable.

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- Repeat steps 1 and 2 for five times.

- Bubble漂浮, without getting it into the wind, until your eyes or arms are comfortable.

- Blow another bubble and follow the same direction and record the time, date, location and describe your local environment by answering questions 1-6 on page 6 of the Workbook.

- Repeat steps 1 and 2 for five times.

Bubbles can get involved with. OPAL wants to inspire a new generation of environmentalists by understanding how it alters the speed and direction of the wind.

Activity 4

Global climate change is predicted to result in hotter summers and hotter winters across the UK. In a few decades, we might even see a strong link between weather and climate change. People might have to become more adaptable and we will all have to adapt to higher temperatures from warmer climates. We will all have to adapt to higher temperatures from warmer climates. We will all have to adapt to higher temperatures from warmer climates. We will all have to adapt to higher temperatures from warmer climates.

How will your results be used?

The activities of the OPAL climate survey tell us about aspects of weather and climate that cannot be measured by the standard methods. By putting this new information together we will be able to use it to understand how we talk about weather and climate climate.

Activity 1

Global climate change is predicted to result in hotter summers and hotter winters across the UK. In a few decades, we might even see a strong link between weather and climate change. People might have to become more adaptable and we will all have to adapt to higher temperatures from warmer climates. We will all have to adapt to higher temperatures from warmer climates. We will all have to adapt to higher temperatures from warmer climates. We will all have to adapt to higher temperatures from warmer climates. We will all have to adapt to higher temperatures from warmer climates. We will all have to adapt to higher temperatures from warmer climates. We will all have to adapt to higher temperatures from warmer climates. We will all have to adapt to higher temperatures from warmer climates.

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