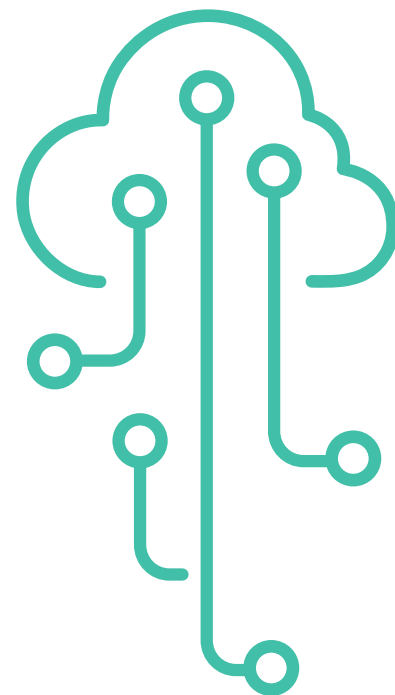# Bringing data to life

Introduction

Overview

This lesson explores the question: "What will weather information of the future look like?" Your class will be introduced to some of the key tools the Met Office uses to bring weather data to life. They will then use their imagination to create their own vision of how weather data might be communicated in the future.

Time required

70 minutes for all activities (or less if individual tasks are selected)

Materials required

- Bringing data to life film
- Bringing data to life slides
- Fact-file template (available on page 7)
- Storyboard template (available on pages 8 – 10)
- Planner (avaialble on page 11)
- Data, impact and industry cards (available on pages 12 – 16)
- Pens and paper
- Access to the internet and handheld devices (optional)

Learning objectives

This lesson will enable students to:

- Identify the skills and careers involved in communicating weather information

- Explore different types of data visualisation technologies and how they can be used to benefit different industries and organisations

- Demonstrate practical ways of using creativity to design a weather app of the future

Curriculum Links

- **Mathematics and numeracy** – Understanding ways data can be presented

- **PSHE and citizenship/PSE/health and wellbeing/PDMU** – Careers and the responsibilities of citizens in a changing world

- **Geography/social studies/the world around us** – Data modelling tools, strengths and weaknesses

Activity steps

01 To open the lesson, introduce your class to the topic of weather visualisation and data by playing the supporting video. Ask the following prompt questions for them to discuss in pairs:

- What do you think is meant by 'weather data'? (I.e. it can refer to observed and forecast data, as well as data that reflects the actual and predicted impacts of the weather)
- What tools are used to present, communicate and visualise weather data?
- What examples of weather data visualisation have you come across?

Ask the pairs to share their answers and show the supporting slide showcasing some of the cutting-edge data visualisation techniques being used to communicate the weather today. Explore the gaps in students' understanding which have been highlighted in the slides.

15 minutes

Groupwork

Slides 2 – 3

Bringing data to life film

Activity steps

02

Split the class into groups of 4 – 5 and explain that they'll be tasked with thinking about how weather data might be visualised in the future.

Working in their groups, students must first complete the data fact-file template (found on page 7) using online research. This can include but is not limited to:

- Air (or sea surface) temperature
- Atmospheric pressure
- Wind speed and direction
- Precipitation (rainfall)
- Cloudiness
- Impacts of weather

The fact-file should include images of some of the data visualisation techniques, and an exploration of how the same data set can be represented in different ways.

Circulate amongst the groups and ask them prompt questions to enhance their research and learning such as:

- What kinds of people/organisations would be reliant on the weather data they have researched and why?
- What is the benefit of visualising data as opposed to presenting it in other forms?

15 minutes

Groupwork

Fact-file template

Activity steps

03

Using the fact-file they have created in Step 2, groups must select a type of weather data to help create an app of the future.

Give each group a storyboard template (found on pages 8 – 10). Explain that to design their app of the future, they will need to decide on the following:

- Target audience
- Title of the app
- Type of weather data
- Design of the content – what tools will the app have to make the data visualisations useful to people's everyday lives or businesses? For example, could the app recommend the kinds of clothes to be worn each day, or the route a delivery van needs to take to avoid bad weather
- What purpose will the app have and what problem will it help to solve?
- What is the app's USP (Unique Selling Point)?
- An explanation of how the weather data will be visualised

Allow time at the end for the groups to pitch their app ideas to the class. To add more of a business angle to this activity, you may like to invite each group to incorporate a Dragons' Den style overview, which includes their app's unique selling point and suggested cost to download. The supporting planner worksheet (found on page 11) can help students flesh out their ideas.

Tip: The app can be designed using pen and paper using a downloadable template (found on pages 8 – 10). Alternatively, if your class has access to the internet and handheld devices, you can download the **POP prototyping app** to help your class bring their designs to life in a prototype digital format.

25 minutes

Groupwork

Slide 4

Storyboard template and planner

Activity steps

04

Finish the lesson with a hands-on activity.

Hand out a card (found on pages 12 – 16) to each student. Each card will contain either a visualisation of weather data, a description of the weather or an impact.

The students must arrange themselves into the correct grouping of three relevant to their cards.

Each data visualisation corresponds to a card outlining the weather impact and an industry that depends on this type of visualisation to make decisions. For example, in the first set:

- Card 1: a graph showing temperature increase and low rainfall for a given month
- Card 2: a description of the drought
- Card 3: its risk to agriculture

Once all the groups are assembled, ask each group to explain their cards and their rationale for choosing to stand or sit together.

Close the lesson by asking the class to reflect on the lesson objectives by writing down their key learnings in relation to:

- weather data visualisation
- weather impact on industries

15 minutes

Groupwork

Data, impact and industry cards

Fact-file template

Draw or describe some different visualisations of the following types of data. There may be more than one way to represent the same data set.

Air (or sea surface) temperature	Atmospheric pressure	Wind speed and direction

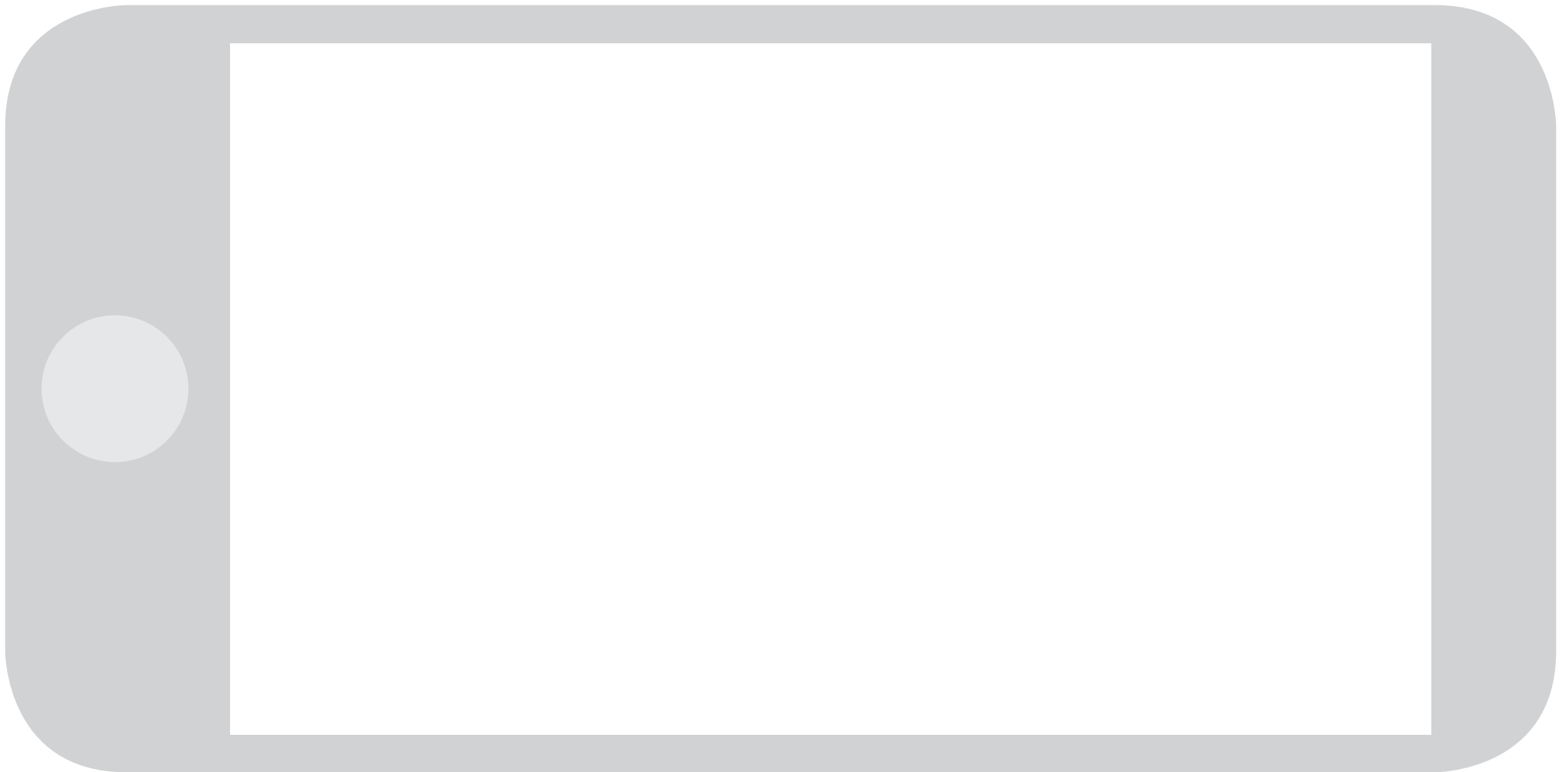| Precipitation (rainfall)	Cloudiness	Impacts of weather

Worksheet: Design an app – storyboard template
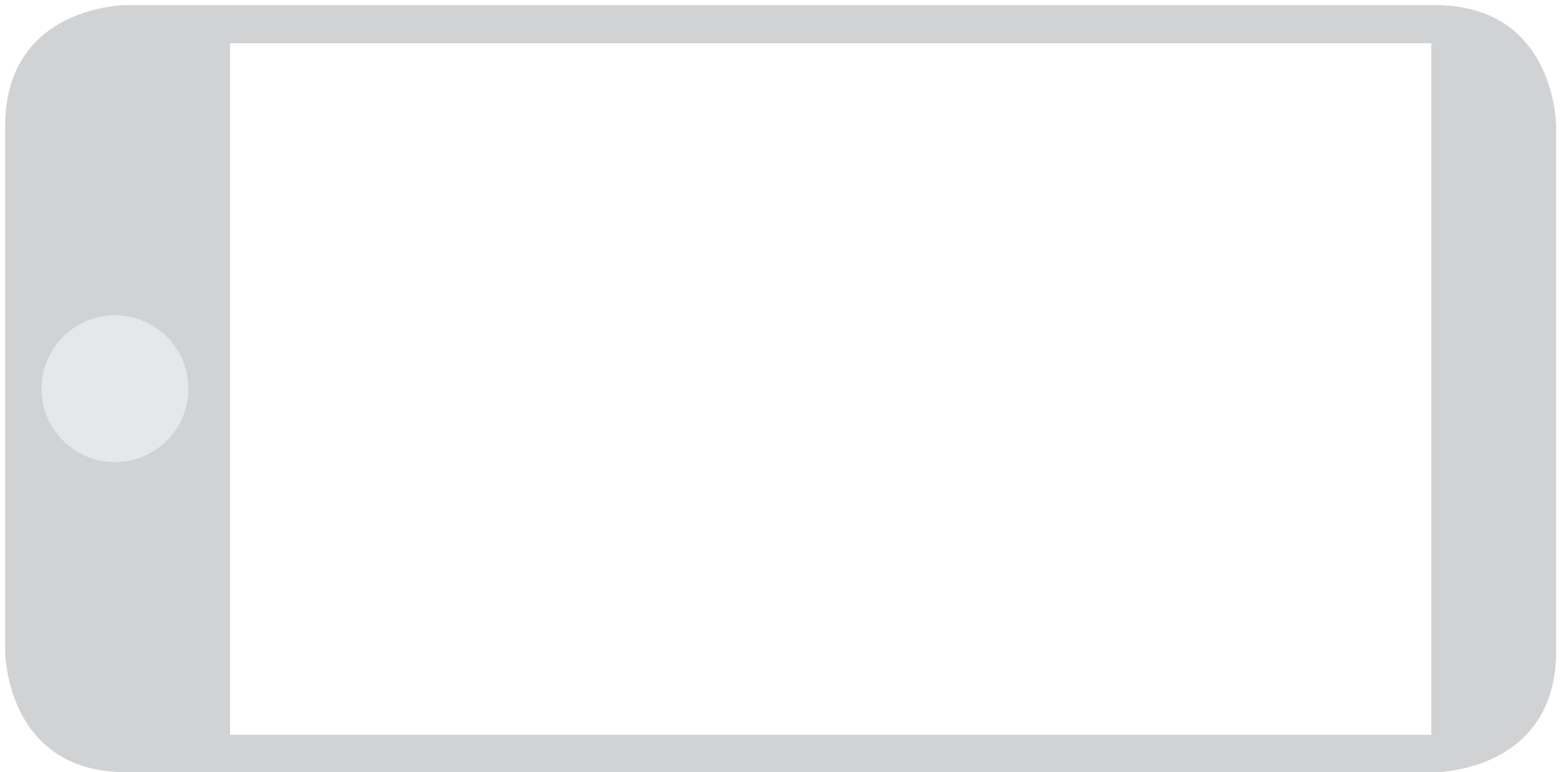
Front page or logo for the app – how will you make it stand out from the crowd?

Worksheet: Design an app – storyboard template

Homepage — what will this include?

Worksheet: Design an app – storyboard template
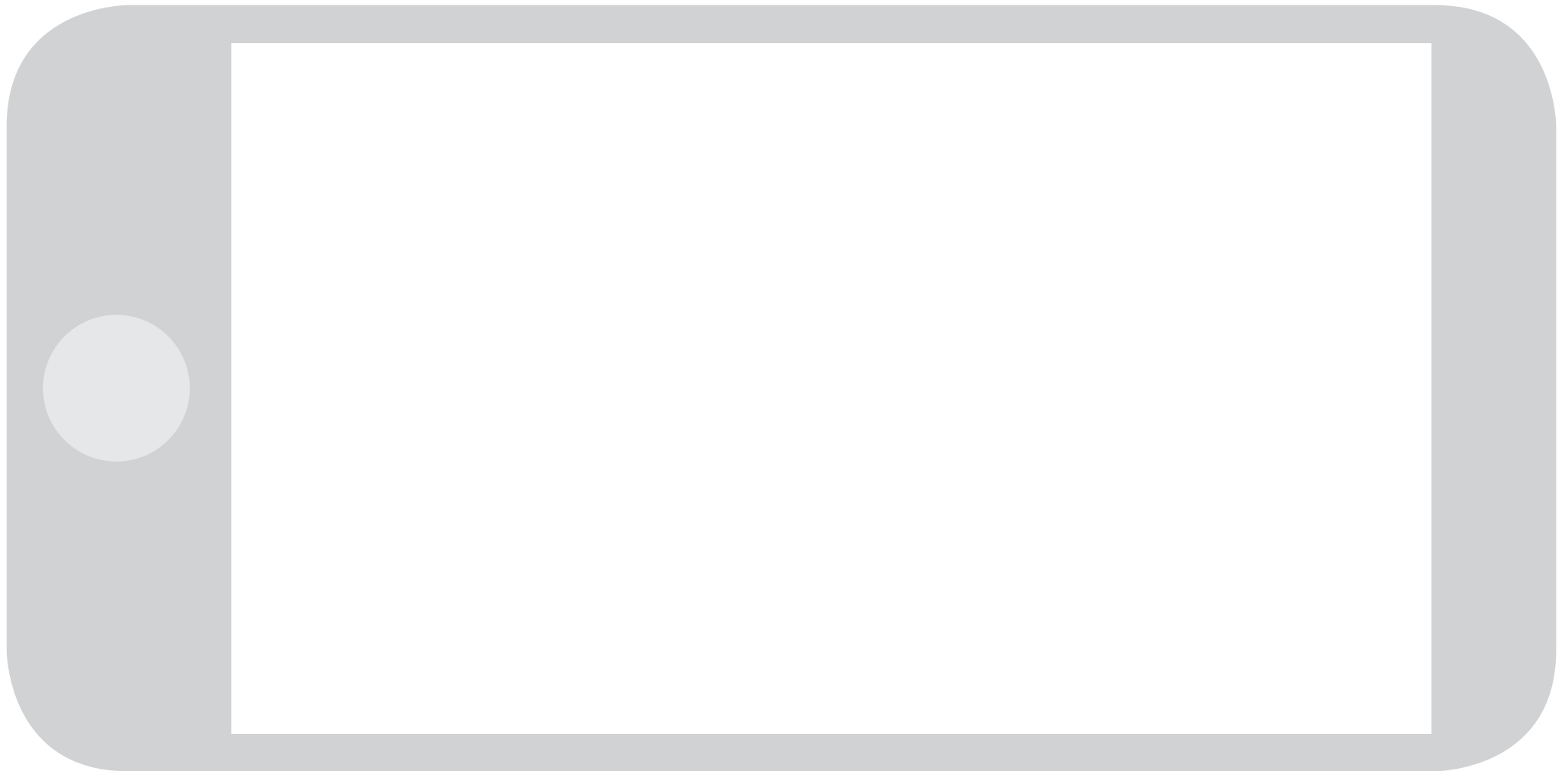
The forecast for the time period your audience is interested in

Planner

Overall aim:

Target audience:

How will the app be useful for people?

Type of weather data needed:

How will the weather data be displayed? (Data visualisation)

How will the weather data be collected or produced?

What tools will the app have?

Data, impact and industry cards
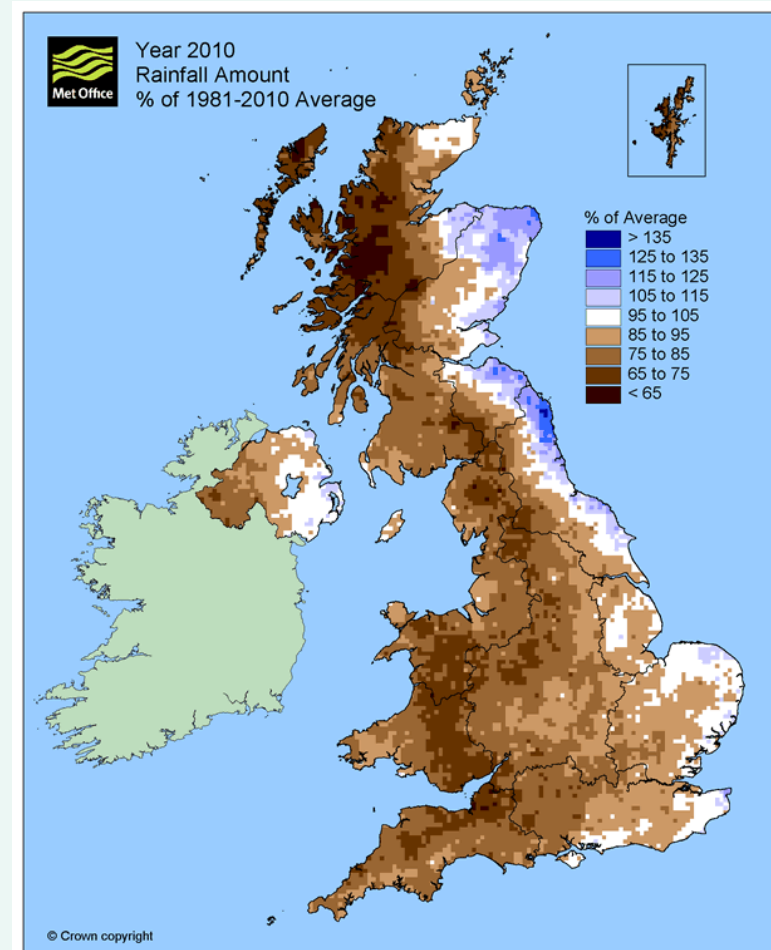
Drought

Description: When rainfall is below-average in an area for a prolonged period, water shortages can occur.

Risk it poses: River and reservoir levels begin to drop, groundwater levels drop and risk of wildfire increases. In extreme cases crops can fail as the soil does not contain sufficient moisture to keep them alive.

Data, impact and industry cards

High pollen count

Description: Trees, plants and flowers release high amounts of pollen.

Risk it poses: Adults and children suffering from hay fever, which is particularly hard for people who have other conditions like asthma; meaning an increased number of people requiring medication and treatment.

The pollen season includes three main phases:

Tree pollen | Grass pollen | Weed pollen

Pollen Calendar — Main release period — Peak

| Pollen type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Hazel (Corylus)									
Yew (Taxus)									
Alder (Alnus)									
Elm (Ulmus)									
Willow (Salix)									
Poplar (Populus)									
Birch (Betula)									
Ash (Fraxinus)									
Plane (Plantanus)									
Oak (Quercus)									
Pine (Pinus)									
Lime (Tilia)									
Grass (Poaceae)									
Dock (Rumex)									
Mugwort (Artemisia)									
Nettle (Urtica)									
Oilseed rape (Brassica Napus)									
Plantain (Plantago)									
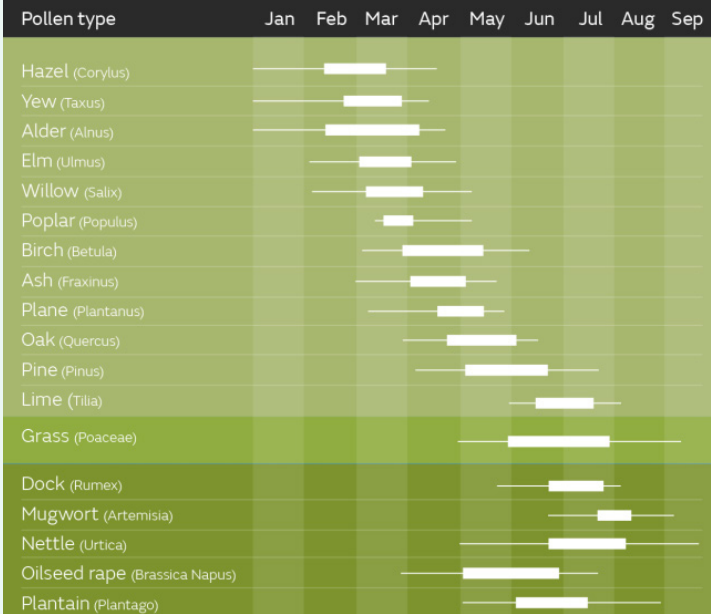
Data, impact and industry cards

Flooding

Description: Overflow of water on land, normally due to unusually heavy rain or from the sea.

Risk it poses: Homes can be uninhabitable due to water damage. Transport and energy infrastructure is affected. People might be evacuated. Bridges can be destroyed and the natural environment can be damaged.
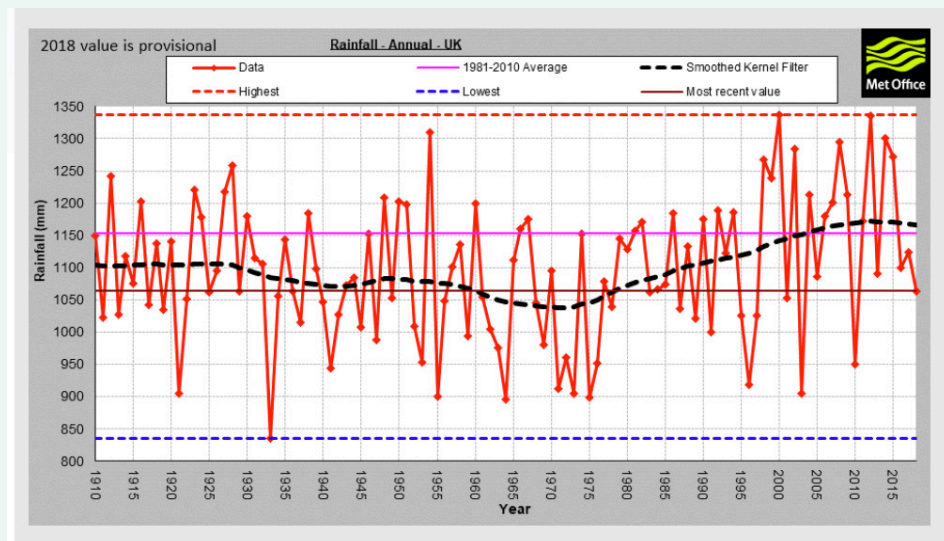
Data, impact and industry cards

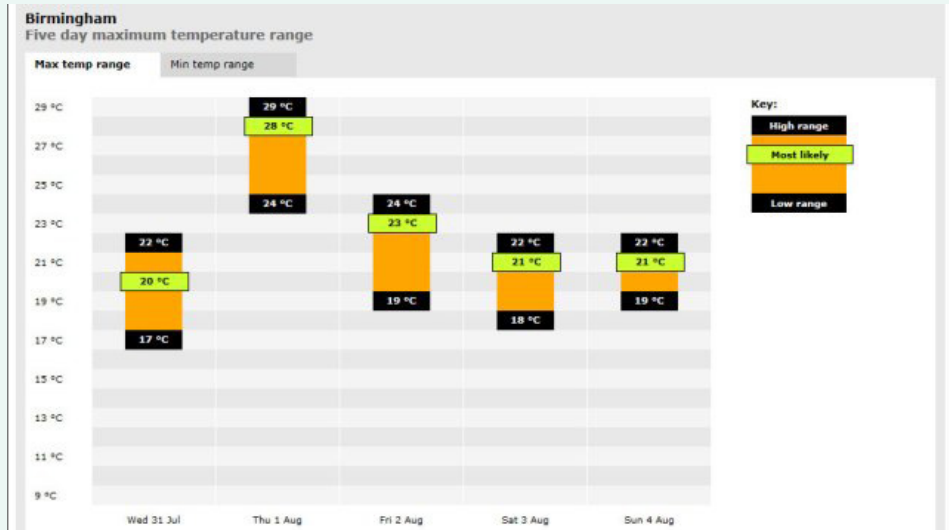## Heatwave

Description: A prolonged period of hot weather, which may be accompanied by high humidity.

Risk it poses: A higher number of people suffer from heat-related illnesses such as sunstroke and heatstroke, causing a sudden strain on healthcare services.

Birmingham
Five day maximum temperature range

Max temp range | Min temp range

Key:
High range
Most likely
Low range

Data, impact and industry cards

Snow

Description: Tiny ice crystals in clouds stick together to become snowflakes. If enough crystals stick together, they'll become heavy enough to fall to the ground.

Risk it poses: Transport can be disrupted, with rail and air services delayed due to snow on the tracks and runways, roads becoming impassable, and pavements being slippery for pedestrians.

Met Office

Expected fresh snow accumulation between 0300 on Friday 18th Jan and 0900 on Saturday 19th Jan 2013.

10-15cm quite widely, locally 20cm or more over hills. Snow will drift in strong winds.

5-10cm widely, locally 10-15cm above 200m. Drifting and blowing snow, particularly above 200m.

10-15cm, locally 25-30cm with severe drifting and blizzards

2-5cm generally, but locally 10cm over hills. Note that a thaw of lying snow will occur across southwestern areas later.