



# TEACHERS' PACK

— *Notes for Teachers* —



SOCIETY EST. IN 1978

**YOUR HERITAGE**

*Pass it on*

# *National* CURRICULUM LINKS

It is suggested that a visit to the Croydon Airport Visitor Centre is most suitable for Key Stage 2 pupils. Consequently, this pack of worksheets has been designed with their curriculum needs in mind. The key links between the resources available in this pack, at the Visitor Centre and the student's class work are believed to be as follows:

## **GEOGRAPHY**

### **Geographical enquiry and skills**

- To use maps and plans (Ordnance Survey maps of the area in 1932 and 1994 are included for comparison)
- To use secondary sources of information...photographs etc
- To draw a sketch map of the locality

### **Knowledge and understanding of places**

- To identify how and why places change

## **HISTORY**

### **Knowledge and understanding of events, people and changes in the past**

- To identify and describe reasons for, and results of, historical events, situations and changes in the period studied

### **Historical interpretation**

- The past is represented and interpreted in different ways

### **Local history study**

- Investigate how an aspect in the local area has changed over a long period of time

## **Health and Safety**

## **MATHEMATICS**

### **There is much of value at the Visitor Centre, especially in regard to the interactive displays**

- Shape, space and measures
- Understanding properties of shape
- Understanding properties of position and movement
- Understanding movement

### **Handling data**

- Using and applying handling data
- Processing, representing and interpreting data

## **SCIENCE**

### **Light and sound**

- Everyday effect of light vibration of sound

## **DESIGN AND TECHNOLOGY**

- Knowledge and understanding of materials and components.
- How the working characteristics of materials affect the ways they are used
- How mechanisms can be used to make things move in different ways
- How electrical circuits, including those with simple switches can be used to achieve results that work

## **I.C.T.**

- Exchanging and sharing information
- Displays, poster etc

## **ENGLISH**

- Speaking and listening
- Group discussion and interaction

### **Reading**

- Reading for information
- Scan texts for information
- Draw on different features of texts, including print, sound and image, to obtain meaning

### **Writing**

- Follow up work will obviously cover composition, planning and drafting, spelling, punctuation, handwriting and presentation

## **ART AND DESIGN**

- Breadth of study
- Using a range of materials for example, silhouettes of aircraft and collages



## — *Early Days* — AT THE AIRPORT

Croydon Airport Visitor Centre tells the story of the world's first purpose-built international airport where people from all over the world flew into Britain. It was the hub of Britain's aviation activities in the early 1930s, rapidly spreading the lucrative mail, freight and passenger services in ever-expanding routes across Europe and the Empire. It was here, in the Control Tower, that the first air-traffic control procedures were developed.

The first day of the operation of London's new air terminal on Purley Way was 30 January 1928. Croydon Airport, and the hotel next door, had been built by the Air Ministry at a cost of £267,000. However, flying started on land which became Croydon Airport, when the Royal Flying Corps established an airfield, known as Beddington, for the air defence of London in 1915. This was on land leased from Manor Farm to the west of Plough Lane (this part of Plough Lane is now called Mollison Drive). Nearby, a National Aircraft Factory was established at Waddon and adjacent to the then Coldharbour Lane (now Purley Way) and Stafford Road. This was on land originally used by New Barn Farm. The purpose of the National Aircraft Factory was to build aircraft, engines and propellers in great numbers for the First World War. The aircraft were test flown from Waddon Aerodrome, to the east of Plough Lane.

Civil aviation was officially approved in May 1919, after the end of the First World War. Croydon was designated as London's International Terminal Airport in March 1920 with full customs facilities. Plough Lane divided the site, with hangars to the west and flying field, customs, and administrative buildings and even a hotel, to the east, necessitating an aircraft level-crossing.

In 1925 it was decided that improvements had to be made and the Croydon Aerodrome Extension Act began the process of extending the airport. Plough Lane was closed to through traffic and Waddon and Beddington Aerodromes were incorporated into the plan.

In preparation for the new airport, hedges in the area were removed and ditches filled in. The motley collection of buildings at Plough Lane were to be superseded by a purpose built structure having everything under one roof: offices, including airline booking offices; buffet; customs area; Post Office; Wireless Room and Control Tower (which now houses the Visitor Centre). The old Coldharbour Lane gave way to the new Purley Way and a brand new hotel was to be built.

There was a large open landing space on firm grass (no hard runways because the aircraft were smaller and lighter in those days). It gave a 1000 metre run in all designated directions. Later, in 1931, a long white chalk line was painted across this grass to help pilots to keep straight when taking off in fog, as there had been many near-accidents.

### PILOTS AND PASSENGERS

Many of the pilots had been First World War fliers and some were from abroad. Pilots came from different parts of the Empire to train and in addition there were pilots of foreign airlines who flew into Croydon.

Air travel in the early days was the prerogative of the rich and famous. Passenger lists show the names of princes, film stars, diplomats, and people on urgent assignments such as jockeys and members of the press and rich business men. The passengers often enjoyed considerable luxury with delicate blue and white china and damask tablecloths and napkins available on some flights. There were softly-cushioned seats with plenty of space, shaded electric lights and a bell to summon the steward. This standard was epitomised by Imperial Airways' Handley Page H.P.42 (see later).

The aircraft were light and it was essential to balance them correctly or they would not get off the ground. Each passenger, plus their luggage was weighed on scales at the airline desks in the Main Hall. The scales faced away from passengers in order to avoid any embarrassment! When everything had been weighed it could then be decided where everyone should sit. Baggage, freight, the bar and the toilet were usually in the centre of the aircraft. The passengers were placed in positions that would ensure that the plane was balanced.

The highlight of everyday at Croydon was the 12.30 departure to Paris. This was the Imperial Airways' Silver Wing service. From the 1930's the giant Handley Page H.P.42 airliner was used on this service. The pilot would arrive to inspect the aircraft, which was always shining, with crew and stewards lined up. This drew crowds of spectators every day. They paid for a guided tour and then crowded onto the roof of the hotel to see the loading operations and the take-off. The pilot climbed aboard, the Civil Air Ensign (or flag) was lowered through the roof and a traffic assistant on the balcony of the Control Tower gave permission, with a signal from his lamp, for the aircraft to take off. The H.P.42 aircraft had names such as Horatius, Hengist, Hercules and Helena.





## RECORD-BREAKING FLIGHTS

Croydon was used by many record-breaking flyers. In July 1924, three Douglas World Cruisers were flown in by military pilots, during the first ever round the world flight.

In May 1927, Charles Lindbergh arrived from Paris to a tumultuous welcome after his solo crossing of the Atlantic. In 1928, Bert Hinkler set off on the first solo flight to Australia. Amy Johnson left Croydon on 5 May 1930 in her Gypsy Moth Jason and reached Australia twenty days later, the first solo female pilot to do so. She travelled to Croydon by Argosy airliner on 4 August to be greeted by a huge crowd. Other famous fliers to the airport were Jean Batten, Alan Cobham and Charles Kingsford-Smith. In April 1937 the first Japanese plane to be seen in Europe visited Croydon on a goodwill flight from Tokyo.

## CONTROL & COMMUNICATION

The Control Tower was the centre for air-traffic control at the airport. Radio direction finding was carried out by wireless operators at Croydon, Lympne and Pulham. The pilot who needed to know his or her position would ask Croydon and then transmit simultaneously to all three stations by radio telephony or wireless telegraphy for half a minute. Each station noted the plane's bearing. The Lympne and Pulham operators reported to Croydon, where the operator plotted all three bearings on a special map. Where all three intersected was the position of the aircraft. These bearings were accurate to within two miles.

The control room had large windows and was surrounded by an observation platform. It was staffed by a Duty Officer and two wireless operators, whilst a look-out was stationed on the balcony outside. An aircraft wishing to take off had to wait until the pilot saw a disc showing his airlines initials. The second signal was a light controlled by an official on the outside platform. A white light had to be shone directly at the cockpit of a plane and so the operator had a telescope attached to the swivelling lamp so that beam could be directed accurately. When the pilot saw the light he knew he had permission to leave the tarmac area to take off.

## AIRLINES

Imperial Airways had inaugurated the first named flight in the world—the Silver Wing luxury lunch-time service to Paris. It was first flown on 1 May 1927 from the first aerodrome with Argosy Aircraft.

The first 'real' airliner in the world, as claimed by its makers, Handley Page Ltd. appeared in November 1930. It was the H.P.42. It was initially designed for Imperial Airways' Empire service for Egypt to India Section. This eastern version carried



24 passengers and could also carry large quantities of mail and freight. A western version, used on the shorter European routes, seated 38 passengers in ample space and comfort but with less capacity for mail and freight. The H.P.42 was a giant four-engined biplane with wingspan of 40 metres. The aircraft cruised at a modest 95–100 mph. It first carried fare-paying passengers on the Croydon to Paris route in June 1931. For seven years the H.P.42s were the only airliners from which a full catering service was provided. For example, on the Silver Wing lunchtime service to Paris, a five-course meal, with hot food served. In the evening, a seven-course dinner was available, rounded off with coffee and liqueurs of course!

At first, as well as passengers, airmail and freight were of importance to the airlines and the carrying of these was well established at the time of the opening of the new Croydon buildings. Imperial Airways carried freight to Egypt, Palestine Iraq, Persia and India. Airmail letters were eventually carried to all parts of the Empire without surcharge.

On some routes the carrying of freight and mails were the money-makers as passengers were few and far between.

## NUISANCE

Throughout the 1930s people in the Croydon area were unhappy about the noise and low-flying aircraft and there were meetings of residents and complaints to newspapers and Members of Parliament.

People living nearby were worried about crashes, although over the next decade hundreds of thousands of passengers were carried in safety. There were inevitably a few crashes and these linger in the public memory.



## COUNTDOWN TO WAR

Towards the end of the 1930s there were increasing signs of the coming conflict with Germany. It was noted that the crews of the Lufthansa aircraft, flying in from Germany, were frequently being changed. It was thought that this was to familiarise as many airmen as possible with the route to Britain. Their planes also took off in total darkness at night, ignoring safety measures, in order to practice night flying. They were equipped with special devices not fitted in other airlines' aircraft.

It was also noted by Air Traffic Control that whenever weather conditions gave an excuse, Lufthansa airlines would fly over RAF airfields at Biggin Hill and Kenley and other potential military targets.

In the summer of 1939 Croydon Airport became extremely busy as people returned home from abroad, fearing the coming of the war. Croydon saw an increase in traffic as holiday-makers from Europe flew back in their hundreds and were joined by refugees, including unaccompanied children. The Times reported on 26 August that 1,500 passengers had arrived that day compared to the usual 400–500.

The weekend of September 2nd/3rd was one of intense activity at Croydon as the changeover from a civilian to a military airfield was made. The civil aircraft were flown to Whitchurch, near Bristol and Croydon was now Royal Air Force Station Croydon.

At 10.30am on Saturday, September 2nd RAF planes flew in from a clear blue sky. Twelve Gloster Gladiators landed and were distributed around the perimeter of the field. Four reserve machines were put in the hangars. The airmen were also accommodated in the hangars whilst the officers were billeted in the Aerodrome Hotel.

Later that day, 19 Hurricanes of No.17 Squadron arrived from North Weald followed by Hurricanes of No.3 Squadron from Biggin Hill. There were now over 50 fighter aircraft, together with their pilots, ground crews and administrative staff. Later, No.17 Squadron, although based at Croydon, were making frequent journeys between there and Manston Aerodrome in Kent, to be nearer the action.



Britain's airspace was divided into two by a line running from north to south. The east was under Fighter Command (which included Croydon) whilst the fleets of planes belonging to small private companies were sent to the west. The headquarters of this western area was Bristol. These planes became very useful in the war effort doing 'fetch and carry' work.

During the course of the war there were many incidents and enemy attacks on Croydon but Thursday 15 August 1940 was a very grim day. The fighters had had a period of intense activity, repeatedly flying off to intercept enemy aircraft. At about 6.45pm German planes began to attack the airfield. The terminal building was hit, the Control Tower was machine-gunned and six airmen were killed as well as several injured. Many civilians in factories around the airfield were killed either by bombs or machine-gun bullets. Some enemy planes dived to machine-gun the area. The air-raid sirens had never sounded! (A blue plaque at the entrance to the Bourjois factory in Queensway commemorates this air raid).

During the Battle of Britain, fighter planes from Croydon played a crucial part, but the end of 1940 saw the final stages of its front-line role. A special memorial in Purley Way commemorates the Battle of Britain and the pilots who gave their lives flying from Croydon.

## FROM WORLD WAR II TO CLOSURE

The war brought with it innovations in aircraft design which meant that air travel was changed forever. Afterwards, Croydon did not retain its status as an international airport for long and its days of air travel within the Empire were over.

In 1946, London Airport (Heathrow) opened and because Croydon could not accommodate the new larger aircraft, Aer Lingus, Air France, KLM, SABENA, Swissair and others moved to Northolt or Heathrow.

The smaller British companies such as Morton Air Services, Olley Air Services, Transair and Jersey Airways continued to operate from Croydon. Also, the airport remained busy with flying clubs and overhaul businesses such as Rollasons and Field Aircraft Services who converted RAF aircraft for civil use.

Gatwick Airport opened as London's second main airport in 1958 and this heralded a final run-down of operations at Croydon. The locally-based flying clubs and other organisations left for new airfields, including Redhill and Biggin Hill and finally in 1959 Croydon Airport closed. The last international flight out was on 30 September, by a Morton Air Services Heron G-AOXL to Rotterdam similar to the one that you will see at the entrance to Airport House. Appropriately this final flight was flown by Captain Last.

Surprisingly, flying from Croydon took place again in 1980 when an air show was held to celebrate the 50th anniversary of Amy Johnson's epic flight to Australia. At another air show in 1988 a Spitfire fighter was skilfully flown from the famous aerodrome.



# FAMOUS PASSENGERS

*History 1930s - On site (second floor)*

Most of the people who flew in the 1930s were rich and many of them were famous. These included important visitors from abroad such as the Crown Prince of Abyssinia (now Ethiopia), His Highness Merid Asmath Asfa Wossen, son of Haile Selassie. He arrived at Croydon on January 14th 1932 for a month-long tour of Europe.

Look at the big pictures behind the boxes of clothes. These are real photographs of people who were passengers at the airport.

**Now look at the boxes. To whom did the clothes belong?**

Box 1 .....

Box 2 .....

Box 3 .....

Box 4 .....

The pilots often came from other countries.

**Name three of the countries.**

1 .....

2 .....

3 .....

What is a politician?

**Name a politician who flew into Croydon.**

.....

**Now, four children can dress up in the clothes.**

**Which outfit do you like best?**

.....

Look at this picture

**What is the lady wearing that looks unusual today?**

.....

In the 1930s everybody wore hats. Look at the pictures behind the boxes.

You can see that none of the ladies are wearing trousers. In the 1930s it would have been unusual to see female passengers in their best clothes wearing trousers.

**Write down anything else that you notice about the clothes.**

.....



**Draw any item of clothing you like.**

# IMPORTANT EVENTS AT CROYDON

*History 1930s / Mathematics*  
*On site (second floor)/At school*

**1926**

Who was the first member of the British Royal family to fly with Imperial Airways?

.....

**1928**

On what date did the Terminal open?

.....

**1930**

Amy Johnson returned to Croydon. How long had she taken to fly from London to Australia?

.....

**1937**

Jean Batten flew from Australia to Croydon. How long did this trip take?

.....

Approximately how much quicker was this than Amy Johnson's flight?

.....

**1939**

Lufthansa was a German airline. Why did the last German plane leave Croydon on 31 August?

.....

The civil aircraft left Croydon. Where did they go?

.....

Who took over the airfield?

.....

**1940**

What date was Croydon Airport first bombed?

.....

**1959**

Croydon Airport was closed down. Who flew the last plane?

.....

Where did it fly to?

.....

The plane that you passed under when you arrived is similar to the last one that flew from the airport. As you go out, notice what sort of plane it is.

## BACK AT SCHOOL



Amy Johnson (1903–1941) was the first woman to fly alone from England to Australia. She was killed when her plane crashed into the Thames during World War II.

Try to find out more about Amy Johnson.

**How long does it take to fly to London from Australia today?**

.....

Try to find out more about the bombing of Croydon during the war. You could visit Lifetimes at the Clocktower to do this.



# IMPERIAL AIRWAYS ROUTES

*Geography - On site (second floor)/At school*

The routes flown by Imperial Airways increased in number during the 1920s and 1930s. Many more destinations were reached. Coloured dots on the globe show different routes at different times.

In 1920 the routes mention three countries visited.

**What country is added in 1942?**

.....

*Orange dots (1932 routes)*

Begin at CAPETOWN and follow the route to NAIROBI.

**Which continent are you in?**

.....

*Red dots (1934 routes)*

Begin at BRISBANE

**Which country are you in?**

.....

Fly to CALCUTTA

**Which country are you in now?**

.....

**Name one place in Thailand and one place in Malaysia where you could stop along the route.**

.....

**What year did Croydon Airport close down?**

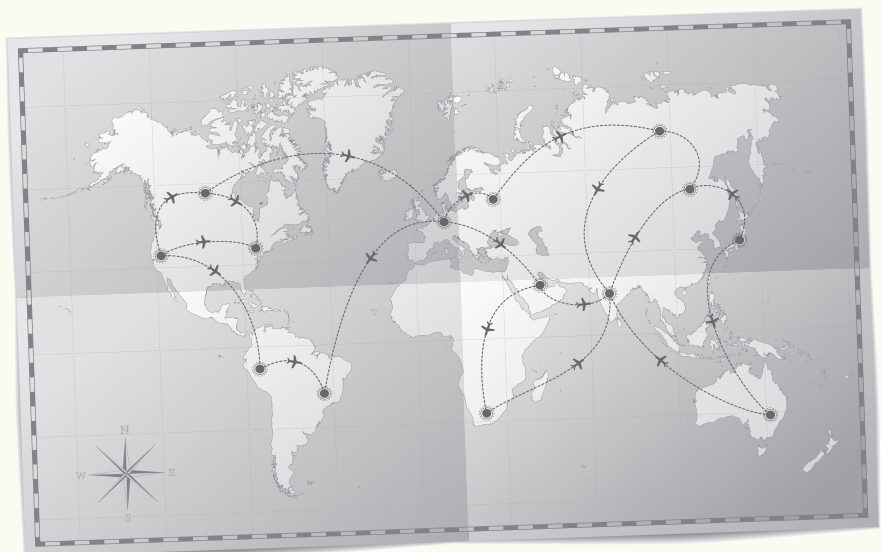
.....

## BACK AT SCHOOL

### AIRLINE ROUTES TODAY

From a travel agent or holiday brochure try to get a map showing routes flown by airlines today.

**If you flew from GATWICK (London) to GREECE for a holiday name three countries that you would fly over.**



# WEIGHING IN

## *Mathematics - On site (second floor)*



On this page draw one of the suitcases.

All passengers and their luggage were weighed at the airline desk in the Booking Hall. The weight had to be carefully balanced on the planes; otherwise they could not take off.

Look at the cases. What are they made of?

This made them very heavy to begin with.

Look at the dial on the big scale

What is printed in red?

What number does this go up to?

At an airport now, are the passengers weighed?

What is printed in black?

Is the luggage weighed?

What number does this go up to?

Later on you could look at a modern suitcase and see how it differs from a 1930s case.

Find out what the weight limit on a passengers' luggage is now.

Work out from the scale 190lbs. = .....kg

### GROUP ACTIVITY

#### WHICH FLIGHT?

An activity for the group and teacher

Choose one child who can pick out the suitcase (be careful as the cases are heavy).

1. Which destination would you like? .....
2. What is the number of the flight? .....
3. Which seat is vacant? .....
4. What is the weight limit for that seat? .....

Weigh yourself with your suitcase. Could you go on this flight?



# SERVING THE CUSTOMER

*History 1930s - On site (second floor)/At school*

People flying in the 1930s were mostly rich. They had been used to travelling on luxury liners and they expected a certain amount of luxury on an aircraft.

On some flights they had china plates, cups and saucers and on the tables they had damask cloths and table napkins.

Look at the photographs.

Look at the Imperial Airways coffee pot, cups and saucers.

**What colour is the logo of Imperial Airways?**

.....

**If a passenger felt queasy (a bit air sick) what could they take to make them feel better?**

.....



**Draw the logo. Draw a cup and saucer or the coffee pot.**

## BACK AT SCHOOL

**DISCUSS** if you have ever been on a plane did you have china cups and saucers and a silver coffee pot?

**What are the airline meals now?**

.....

**Who serves them?**

.....

**How are they served?**

.....

**Are they easy to eat?**

.....

**What makes them difficult to eat?**

.....







# BEARINGS

## *Mathematics/Design & Technology/Geography* *On site (top floor)*

If a pilot did not know where he was, he would talk to radio operators at Croydon, Lympne and Pulham. He would speak to them all at the same time. The operators would then report the bearings to Croydon. The Controller at Croydon plotted these on a big map. Where these intersected was the position of the plane. This took less than two minutes and was accurate to within two miles.

**Why would this information, which took so long to find and was not very accurate, be extremely dangerous at a modern airport today?**

.....

LOOK AT THE INTERACTIVE OF THE MAP like the one used by the Controller. If you look through the window into the Radio Room you can see the real one.

**Name three towns on the south coast of England.**

1 .....

2 .....

3 .....

**Name three towns on the north coast of France.**

1 .....

2 .....

3 .....

On the INTERACTIVE, choose what stage you want. Now have a go!

### TAKE-OFF

In the early days of the airport, planes were small and light.

There were no hard runways so the planes took off on the large grassy area. This made take-off and landing a bit bumpy.

**Why do you think that this method of take-off and landing would be no use today?**

.....

Why do you think that we have very long, smooth runways with different coloured lights?

.....

**How well would you control the plane over bumpy ground?**

.....

Try the INTERACTIVE for yourself and see if you get the plane out the hangar and straight down the runway!

(TIP: use small, gentle movements).



# WHO'S APPROACHING

*Mathematics/Art - On site (top floor)/At school*

There was no radar in the early days and so pilots often needed help to find the airport and to land. The duty-look out would be on the balcony to look for planes. In foggy weather they would listen for the sound of the aircraft engines. He would have to recognise their shapes by looking at them through binoculars.

**HOW GOOD ARE YOU AT LOOKING AT RECOGNISING SHAPES?**

**How many types of aircraft are shown on the display?**

.....

**Name three of them**

1. ....

2. ....

3. ....

**HAVE A GO AT MATCHING THEM BY USING THE INTERACTIVE**



**Now draw an outline of the plane you like best.**

**IN THE WINDOWSILL** – Find the PINK notice.

**EASTER ON THE AIRWAY** – Monday April 18th.

**At what time does the plane leave Croydon for Cologne?**

.....

**What time does it arrive in Brussels?**

.....

**How long does the journey take from Croydon to Brussels?**

.....

**Which airline is this?**

.....

**How much is the fare?**

(6.0 means 6 shillings and this equals to 30p)

.....

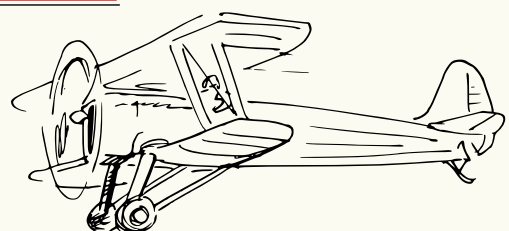
Later, try to find out what the fare is now from London to Brussels.

## BACK AT SCHOOL



**ART**

Back at school use the shape you have drawn. Draw it onto a piece of black paper. Cut out this silhouette. Paint a background of sky with clouds and stick your silhouette on to this background.



# THE RADIO ROOM

*History/Mathematics - On site (top floor)*

This room was the hub of the control system at the airport. From here planes were given their position and were told when to land and when to take off. This was the world's first air traffic control system.

Look at the photograph of the mapping board and then look through the window at the real board.

It was the mapping board that the Control Officer could indicate a plane's position. Have you already tried the interactive about plotting a position?

Look at the tall telephone.



**Draw a picture of a Tall Microphone.**

**How does it differ from a modern one?**

.....

**Why are there binoculars on the table?**

.....

**Who do you think the operator is speaking to?**

.....

**How can he hear the person he is speaking to?**

.....

**On the big map, what are used to indicate the position of aircraft?**

.....







# CROYDON CHANGES

## *Local History Study - At school*

Look at the two maps (1932 and 1994), on the following pages, showing the area around Croydon airfield. Apart from the Terminal Building and the old Aerodrome Hotel, little remains of the old airport because most of the area is now covered with industrial buildings.

### BACK AT SCHOOL

Which big estate now covers the Western part of the grass airfield?

.....

On both maps find the Customs House (Terminal Building). Is it the same on both maps? How has it changed on the 1994 map?

.....

Can you find three hangars on the 1932 map?

.....

What was the hangar used for?

.....

On the 1932 map, who was shown as using the largest hangar?

.....

Many roads in the area were named after famous aircraft or famous flyers. Can you find any?

.....

Is any of the old landing ground still not built over?

.....

If not, what is it used for now?

.....

Find Purley Way on both maps.

.....

Is your school marked on either map?

.....

Is the area where you live marked on either map?

.....

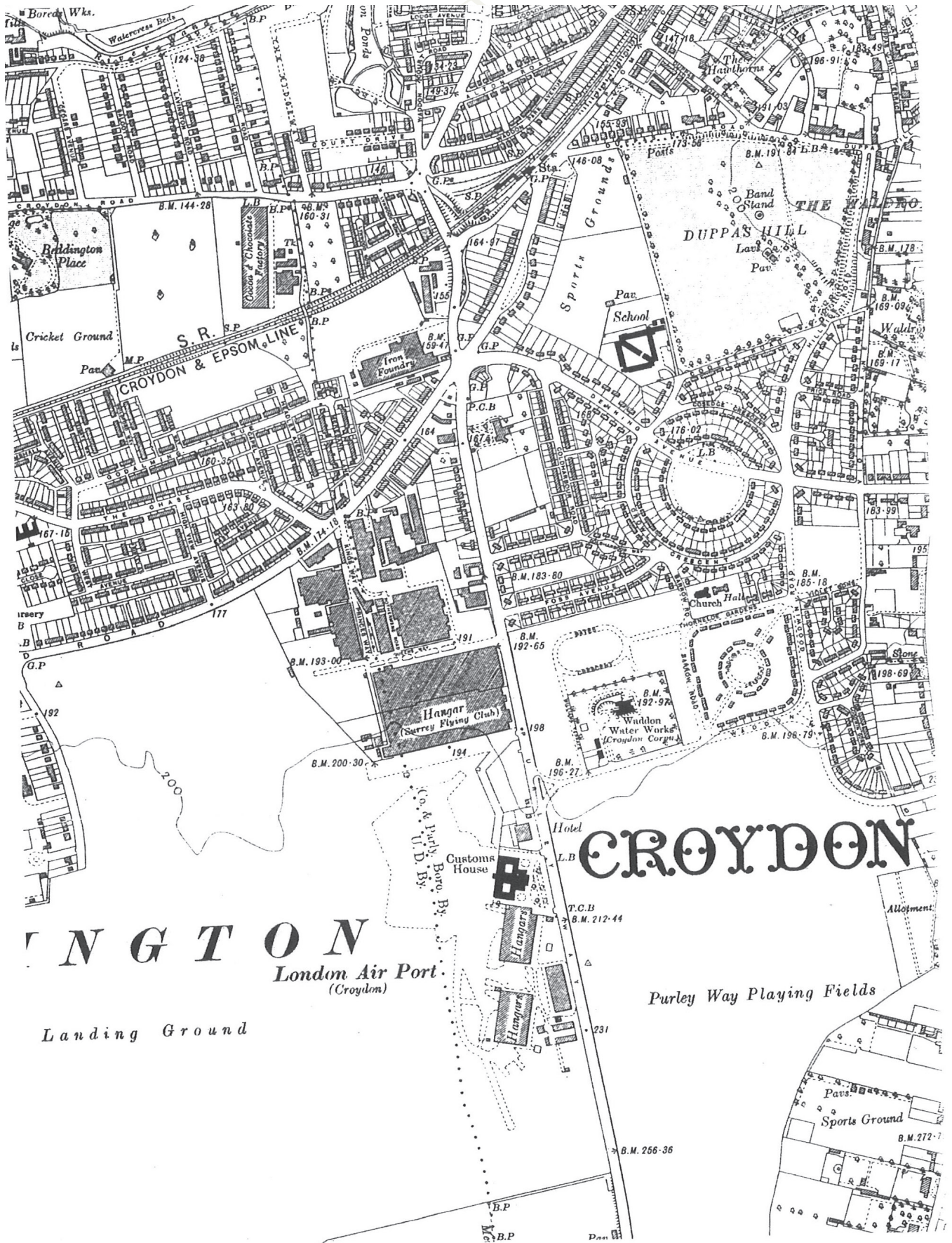


**Draw a sketch map based on the 1932 map showing:**

1. Purley Way
2. Stafford Road
3. The Customs House (Terminal Building)
4. The three hangars
5. The Aerodrome Hotel



**CROYDON AIRPORT**  
VISITOR CENTRE



Area Map 1932

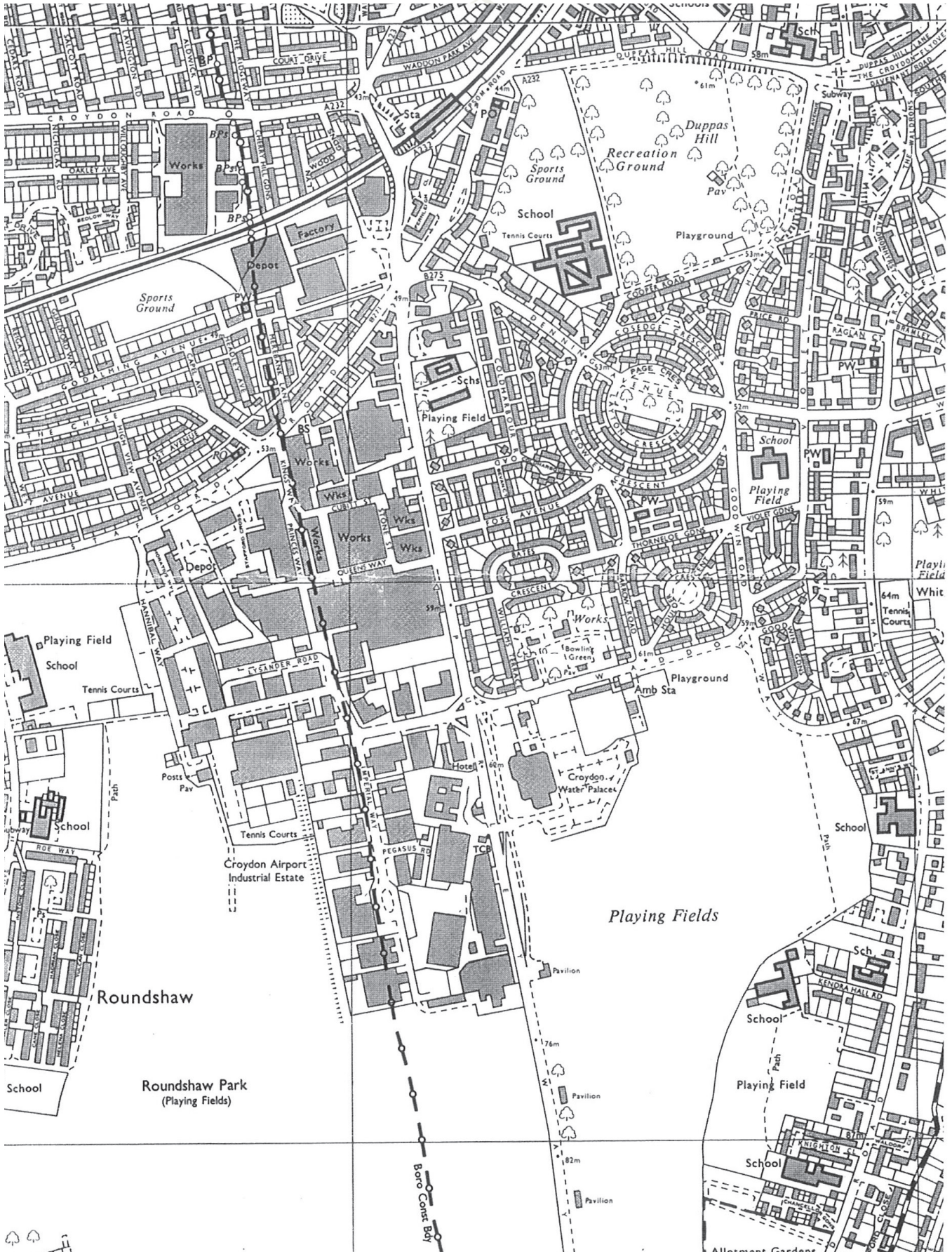






# CROYDON AIRPORT VISITOR CENTRE

## ACTIVITY SHEET NINE (MAP2)



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