**ACTIVITY: Future flight**

**Activity idea**

In this activity, students explore how flight has developed over time with discussion about trends and future possibilities.

By the end of this activity, students should be able to:

* explain in a general way the historical development of flight and the present situation
* describe the trends and drivers for this development
* present a group project depicting ideas for possible future flight.

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**Introduction/background**

Flight capability has been and still is a developing science. People began by observing birds and making kites. That progressed to sketching and then making model flying machines. Hot-air balloons were invented, followed by gliders and finally powered flight. Powered flight was refined over time to the passenger jets and sophisticated air force planes we have today. Rockets were made that went to the moon and into space. Space stations were built that people could live in. What’s next?

In this activity, students are made aware of the history of flight and of the present situation. They examine possible trends and reasons for these developments and changes and look at possible and preferable flight in the future.

The [example answers](#example) for planning the future activity may give teachers some ideas to help extend students’ thinking. However, students may have very different ideas.

**What you need**

* Access to or copies of the article [People in flight history](https://www.sciencelearn.org.nz/resources/305-people-in-flight-history)
* Timeline [A progression of flight](https://www.sciencelearn.org.nz/resources/1691-a-progression-of-flight-timeline)
* Copies of the student worksheet [Planning the future](#planning) or access to the [Futures thinking tool](https://www.sciencelearn.org.nz/resources/2439-futures-thinking-toolkit)

**What to do**

1. In small groups, read [People in flight history](https://www.sciencelearn.org.nz/resources/305-people-in-flight-history). Discuss the progression in flight that occurred between Leonardo da Vinci, the Wright brothers, Richard Pearce and Jean Batten.
2. In pairs, go through the timeline [A progression of flight](https://www.sciencelearn.org.nz/resources/1691-a-progression-of-flight-timeline) (this could be done with the class using a data projector or IWB). Discuss the sequence of development to track how people were thinking.

* What was invented first? After that? In what way did one thing progress to another? (For example, model gliders were developed first before making one that a person could fly, then a motor was introduced to keep the craft in the air longer and so on.)
* What do you think the reasons for the various inventions were? (So people could fly, people could use air space for travel, people could get to faraway places more quickly.)

1. In small groups, identify changes in flight over time and explore what might happen in the future using the student worksheet [Planning the future](#planning) or access to the [Futures thinking tool](https://www.sciencelearn.org.nz/resources/2439-futures-thinking-toolkit).
2. Discuss what types of air transport students envisage will be around in 50–100 years’ time. Have students make sketches and drawings of examples of possible future flight ideas.
3. Have groups collate their ideas and sketches into a group project and present to the class.

**Planning the future**

Identify changes in flight over time and explore what might happen in the future.

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| ***1. The existing situation (what happens now and why?)*** |
| *From a personal perspective* |
| *From a local perspective* |
| *From a national perspective* |
| *From a global perspective* |

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| ***2. Trends (how does this differ from the past and why?)*** |
| *From a personal perspective* |
| *From a local perspective* |
| *From a national perspective* |
| *From a global perspective* |

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| ***3. Drivers (what is causing the changes and why?)*** |
| *From a personal perspective* |
| *From a local perspective* |
| *From a national perspective* |
| *From a global perspective* |

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| ***4. Possible futures (what might happen in the future?)*** |
| *From a personal perspective* |
| *From a local perspective* |
| *From a national perspective* |
| *From a global perspective* |

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| ***5. Preferable futures (what do you want to happen in the future and why?)*** |
| *From a personal perspective* |
| *From a local/national perspective* |
| *From a global perspective* |
| ***6. Explain your thinking*** |
| *My preferred future is:* |
| *Three reasons I think this are:* |
| *Three reasons others might not agree with me are:* |

**Planning the future – example answers**

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| ***1. The existing situation (what happens now and why?)*** |
| *From a personal perspective*   * We use passenger planes to go on holidays around New Zealand and overseas because planes get us there more quickly. |
| *From a local perspective*   * People in our city use planes to go on holiday or to work in other cities. * Helicopters rescue people and take them to hospital in emergencies. They can do this quickly and reach places that we might not otherwise be able to get to, at least in a hurry. * People use hot-air balloons for fun. * Farmers use top-dressing planes to fertilise their farms. It’s quicker than doing it by hand or tractor, gets a good coverage and is more cost efficient. |
| *From a national perspective*   * People use planes to go to work or holiday in other cities or countries. It’s quick, and they can go to faraway places. * Rescue helicopters rescue people (sometimes from places that are hard to get to) and take them to hospital if necessary, more quickly than with land transport. * Some people have private planes for transport. These people are wealthy enough to afford them – this transport gets them where they want to go fast. * The army uses helicopters to transport soldiers. It gets the soldiers to their destination quickly and the helicopter doesn’t need an airport to land – it can take the soldiers anywhere they might need to go. * The air force has helicopters and some planes. We are a small country and so don’t have a big air force. Our planes transport soldiers overseas. * Planes and helicopters are used for sightseeing, transporting hunters and deer culling, aerial photography, top dressing – they’re fast and can get to difficult places. |
| *From a global perspective*   * Air force planes protect countries – from the threat of attack or war. * Rockets take people into space – for space exploration and learning. * Space stations house people who are developing knowledge about space. * Passenger jets and smaller planes transport people around the world for work or pleasure. * Planes transport goods from one country to another – people like diversity and the sellers have worldwide markets (i.e higher potential income). |
| ***2. Trends (how does this differ from the past and why?)*** |
| *From a personal perspective*   * I’m able to go to many places around New Zealand and overseas for holidays. Before passenger planes were available, this was not possible. My learning and understanding about other people and places is much greater than those of my age from 100 years ago. |
| *From a local perspective*   * People move about more easily now. They take more holidays in interesting places, which is good for tourism business. People from my city can work in another city using passenger planes. People are able to mix and bring business to lots of different places. * More people’s lives are saved through rescue helicopters because medical people are able to get to them quickly and they can get them a hospital in minimal time. * Hot-air balloons attract people to our city. This has made the city well known and more popular, which is good for businesses. * Farmers can fertilise their farms quickly and efficiently using planes, increasing production. |
| *From a national perspective*   * People are not so parochial now. They mix readily around the country – holidaying or working. This benefits the country as a whole by spreading the wealth. People also mix more easily and are more accepting of each other’s views. * Rescue/medical helicopters and aircraft save lives of people in the whole country. * More people in remote places increasingly have their own aircraft. This means they are not so isolated and can easily purchase supplies and mix with others around the country. In the past, people who live in remote places didn’t have easy access to cities or other places and tended to be cut off from the rest of society. * Having army and air force aircraft means our soldiers can support other countries more easily by sending people and supplies to help them. * Pest control is more effective using aircraft. This means our ecosystem can be more easily kept in balance and native birds can be preserved (for example, culling deer that eat the food of the takahē, which has contributed to takahē becoming endangered). * Using planes for sightseeing helps tourism in New Zealand – bringing in people from overseas, which contributes to our economy. * Top dressing through the use of planes helps our farms to produce better food more quickly – benefiting the country as a whole (both with food in this country and exports). |
| *From a global perspective*   * People are freely moving around the globe – visiting different countries – both for travel experiences and for work. Consequently, people are more accepting of others – experiencing various cultures, learning other languages and living in different countries. * Air force planes protect countries more easily and quickly (than foot soldiers). Their presence helps to keep world peace. * Rockets and space stations have helped us increase our knowledge of space enormously. * Satellites have increased communication around the globe and allowed the development of social networking. This has been good for science, medical and education collaboration and advancement, business and sales, meeting peoples social needs etc. * Goods and produce can be readily distributed around the world increasing diversity of such items (we get to eat all kinds of food) and strengthening the economy of the countries that sell them. This may also strengthen ties between countries that trade, encouraging peaceful relationships. |
| ***3. Drivers (what is causing the changes and why?)*** |
| *From a personal perspective*   * Gaining experiences, knowledge and understanding through travel. |
| *From a local perspective*   * People want new experiences by visiting interesting places. Some people want to live in our city but can take interesting and lucrative jobs in other cities if they can get there easily. Some local shop owners want to sell products from outside the city to increase income. * People want to live and are concerned with improving health and medical help. * Hot-air balloons attract people to our city, which helps to improve the economy in the city (the people spend money). Some people just love flying hot-air balloons. * Farmers can increase their production and their income using planes for fertilising because it’s quick and easy for the farmer. |
| *From a national perspective*   * People want to visit relatives and friends and have interesting holidays in other parts of the country. * People don’t want to die from accidents. People want to fund rescue/medical helicopters and aircraft to help save lives. * People in remote places want to be able to buy goods and produce rather than produce their own, which is labour intensive. They also want to be able to mix with others more. * Supporting other countries with our army and air force means we may be protected by them if we were ever threatened. * Controlling pests by aircraft helps protect our endangered species and to keep our ecosystem balanced – keeping New Zealand ‘green’ and making it a nice environment to live in. * Tourism brings money into New Zealand, which strengthens our economy. * Top dressing through the use of planes helps our farmers to produce better food more quickly. The driver for them is that they make more money, but this also benefits others when they spend it. People also want healthier, tastier food. |
| *From a global perspective*   * People want to travel to other countries to increase their knowledge and experience other cultures. Some people may want to work in other countries for experience and/or to get more money. * People need to feel safe. Unrest in some countries can make people anxious and concerned. The presence of air force craft helps to keep world peace and helps to give people peace of mind. * People want to know if space can be inhabited in the future or if there are other planets like ours. * People have a desire to communicate with others – and it is a way to make money by making people aware of what is available across the globe. * People want things that are different. They are keen to see what people in other countries are producing. Potentially, more money can be made in a global market. |
| ***4. Possible futures (what might happen in the future?)*** |
| *From a personal perspective*   * With faster and less expensive planes, I might get to travel the world more easily than now. My learning and knowledge would increase even more. |
| *From a local perspective*   * People will be able live where they like, and fast efficient aircraft could transport them to where they work – which might be anywhere in New Zealand or even the world. * Future medical craft may be able to ‘take the hospital’ to the patient. Medics might have what they need to rescue people and save their lives on board the craft, with less need for hospitalisation, or they could transport them even more quickly, saving even more lives. * People use other aircraft (as well as more sophisticated hot-air balloons) to attract people to our city. These might be in the form of jetpacks or craft that involve the addition of wings and a form of propulsion that people could use to buzz individually around the city. |
| *From a national perspective*   * Planes will be faster and more efficient, able to convey people in a fraction of the present time to anywhere in the world. The planes would use advanced solar and wind energy systems that adequately meet the energy need rather than fossil fuels. They might be smaller than now and able to land anywhere without the need of big airports, taking people to exotic and places that are difficult to get to. * Small craft may become a regular mode of transport for most people – they would have aircraft rather than cars. This would enable them to live in remote places but be part of society and be able to buy whatever they wanted. * We may get improved military planes – that can carry more soldiers and supplies faster – and more of them (or maybe everyone is at peace and we don’t need this sort of craft any more). * Small and high manoeuvrability craft could help control pests. They could be robotic and programmed to cleanly take out certain pests. |
| *From a global perspective*   * As above, people will have fast, efficient transport planes that can travel and land anywhere in the world. The world will become one big melting pot of cultures. * International super jets could patrol the skies as peacekeepers (or because everyone is at peace, we won’t need them any more). * We may have spacecraft that go even further into space than now – maybe one day travelling at light speed. Space station cities may be built for people to live in – with everything they need for an enjoyable life. * People will be able to socially network through satellites where they can present as holograms and talk to people from other countries. * People can market their products through sophisticated social marketing systems, and these products can be transported immediately by fast and efficient aircraft – maybe a one-day service. |
| ***5. Preferable futures (what do you want to happen in the future and why?)*** |
| *From a personal perspective*   * I would love to be able to easily fly around the country and the world, visiting places. I would like to see fast, inexpensive transport services around the world. |
| *From a local/national perspective*   * People may have their own aircraft commuters (an advancement on the jetpack idea) to go to work around New Zealand. The sky would be a very busy place – so it would have to be very organised and controlled. Larger craft to fit family units could be used instead of cars for vacations. People could get an air licence in a similar way that they do now for cars. |
| *From a global perspective*   * Small, fast jets (using solar and wind energy) transport people around the world in a quarter of the time it takes now. It’s inexpensive and a regular mode of transport. There is no friction between countries so people can easily go anywhere. Trips into space are a regular occurrence and some people stay in space stations for holidays or even live there. Apart from physical travel, people communicate worldwide through social networks – available through satellite systems. Sophisticated systems allow you to ‘walk’ around as a hologram and ‘see’ the immediate environment as you talk (within a restricted distance from the network). |
| ***6. Explain your thinking*** |
| *My preferred future is:*   * The use of small planes or individual jetpack type crafts to move people around the country easily and cheaply – using solar and/or wind energy rather than fossil fuels. This would be the main form of transport. Larger (but still relatively small) jets also using solar and wind energy would transport people to other countries in about a quarter of the time it takes now. Advanced satellite systems enable a sophisticated use of communication around the globe – where people can talk and virtually ‘visit’ others through holograms across the globe. |
| *Three reasons I think this are:*   * Ground space is already busy (with cars and trains) and it is becoming more congested and slow. Air travel is quick and will get quicker in time and we have lots of air space at the moment. Also, people are living and working in different places more and more thanks to the use of computers. They may be required to travel to lots of different places around the country. Small, cheap craft would enable people to get to different places quickly and easily. * Glenn Martin has just developed a jetpack that can travel for 30 minutes and can go about 3000 metres into the air. Based on history, craft are developed over time and refined. A jetpack could become a common mode of transport, because it’s small, quick and easy to get around. * Future craft could use solar or wind energy. Fossil fuels are a limited resource causing people to explore other energy options. Solar and wind are freely available and accessible to aircraft. On-going investigations could result in the efficient use of these energies for future flight. |
| *Three reasons others might not agree with me are:*   * Air travel may not ever be inexpensive. Aircraft are expensive to build and may continue to be so. Research and refining of craft may also be too expensive to do on a large scale. This may include the development of something like the jetpack. Also, it may not be scientifically possible to develop this into an everyday cheap mode of transport. * It may be that aircraft can’t be made to move faster. There may be an optimum speed for the size craft I am considering for the future. * Efficient use of solar and wind energies may not be easily developed for the use of aircraft. If aircraft have to rely on fossil fuels, the future of flight may include diminishing numbers of aircraft. |