principia
SPACE DIARY

ACTIVITY 2.1
UNITED IN SPACE

From Chapter 2 of the Principia Space Diary
http://principiaspacediary.org/activities/united-in-space

LEARNING LEVEL

KS1, KS2, P1-5

CURRICULUM LINKS & DIFFERENTIATION IDEAS

View detailed curriculum links for England, Scotland, Northern Ireland and Wales, plus differentiation ideas for your region and year level.

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Resources Required

- Pen and pencils (including primary colours for the flags)
- Printed fact sheets for the other space agencies (see Running the Activity)
- Encyclopedias or internet for students to find countries' flags

Background to this Activity

Tim Peake undertook his Principia mission with two other astronauts – NASA's Tim Kopra and Russian commander Yuri Malenchenko. Already on board the ISS were Mission Commander Scott Kelly from the US; Russian cosmonaut and fight engineer for the mission Mikhail Kornienko; and Russian cosmonaut Sergey Volkov.

The International Space Station is used by astronauts of many different space agencies. This activity invites students to explore the differences between some of them.

The official languages on the ISS are Russian and English – most labels, instructions and notices are in both Russian and English and the crew will speak a mixture of both languages to each other. Tim needed to learn Russian to become a fully-fledged astronaut and, as he spent much of his training with the European Space Agency in Germany, he also had to learn some German.

Running the Activity

This activity can be used to show how the same information can be presented in a lot of different ways. The students will make their own country card using the blank template in the book. The headings on this card allow the reader to quickly pick out the information they are interested in.

You can demonstrate this by showing students the following paragraph alongside the completed ESA country card in the Space Diary:

The European Space Agency (or ESA) has astronauts from lots of different countries. Tim Peake was the very first British astronaut to fly with them! The first astronaut the ESA sent into space was the German Ulf Merbold who flew as part of a NASA mission on 28 November 1983. The ESA also holds the record for the longest single flight by a woman; the Italian astronaut Samantha Cristoforetti was in space for one-hundred and ninety-nine days and sixteen hours in one go. The official languages of ESA are German ("Hallo") and English (Hello).

Place each of the following paragraphs in different spaces around the room. Invite the students to read each of the entries, then fill out the country card for the space agency of their choice. The students will need to use encyclopedias, the internet or classroom displays to find the country's flag and an awesome fact.

The American space agency is probably the most famous – NASA. They sent their first satellite, the Explorer 1, into space on 31 January 1958. Three years later, their first astronaut was sent into space – Alan Shepard's mission was launched on 5 May 1961. NASA's launch base is also one of the most famous (largely because of the film Apollo 13) – Space Centre Houston is in the state of Texas. Their language is English. The NASA astronaut Peggy Whitson spent an amazing three-hundred and seventy-six days in space over two different missions.

Russian astronauts aren't called astronauts, they are called cosmonauts. That's how it's easy to remember the name of their space agency, ROSCOSMOS. To say hello in Russian you can say "privyet". In Russian it's written like this: **Привет.** Russia launches its rockets from the Baikonur Cosmodrome, the most Northern launch base in the world. Sputnik 1 was launched on 4 October 1957 and holds the honour of being the very first artificial satellite to orbit the Earth. The cosmonaut Gennady Padalka has spent an incredible eight hundred and

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ACTIVITY 2.2
BREAKING NEWS!

From Chapter 2 of the Principia Space Diary
http://principiaspacediary.org/activities/breaking-news

LEARNING LEVEL

KS1, KS2, P1-5

CURRICULUM LINKS & DIFFERENTIATION IDEAS

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Resources Required

- Internet access
- Writing materials
- Interactive whiteboard (optional)

Background to this Activity

Tim Peake and his fellow astronauts had a demanding schedule conducting experiments, doing maintenance, and taking care of their health by combatting the effects of living in zero-gravity.

Imagining they are astronauts, students will write a newspaper article about their first day in space.

Running the Activity

Here's an example of a news article which you can look at with your class: http://www.bbc.co.uk/news/science-environment-35324574

Can you find other blogs and news stories related to this event? Look at a number of different types of story-telling. How does the language used, and the content that is reported, change depending on who the audience is?

Ask children to find examples of stories from news reports on TV, radio, the internet and newspapers. As a group, examine how these differ from the stories we tell each other. What do we tell our friends, our families, our teachers? How would this change if we were writing a newspaper article instead of telling the same story to a friend?

Pupils will then write a newspaper article about their first day in space.

To extend this activity further, students can work together to create a whole newspaper or magazine about the Principia mission, including their own pieces alongside different types of stories that were published during Tim's mission.

Questions for the Class

- What might Tim's daily routine be like? How does this differ from your routine?
- What are some of the things you do each day that Tim couldn't do in space?
- What can you find out about the spacewalk that Tim Peake and Tim Kopra did? Can you gather information to create a news story? Don't forget quotes and pictures as well as the actual details of the story.
- Can you find ISS news stories published by other countries or in other languages? What is different about those compared to British news stories?

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ACTIVITY 2.3
EARTH TO PRINCIPIA

From Chapter 2 of the Principia Space Diary
http://principiaspacediary.org/activities/earth-to-principia

LEARNING LEVEL

KS1, KS2, P1-5

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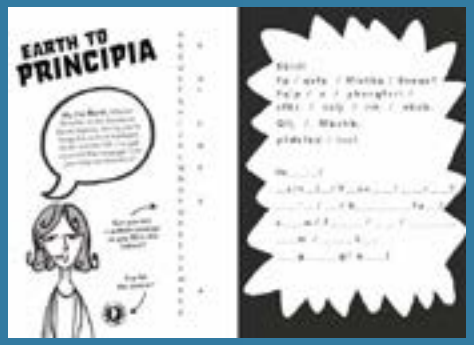

Resources Required

- Whiteboard/Blackboard to help students crack code

Background to this Activity

Astronauts communicate with Mission Control and their families using a network of satellites called the Tracking and Data Relay Satellite system. The first of these satellites was launched in 1983. Video links aboard the ISS show Mission Control what is happening in space, and can be used to help guide astronauts through activities, if they need assistance.

There is even internet in space, which helps astronauts stay in touch with their families and friends. Unfortunately the internet is very slow, but it is still an important link to Earth. Sometimes codes are used in space, so that the right message gets to the right person or organisation.

Running the Activity

In this activity we ask students to decode a message and to do this they will need lots of patience - just like the best astronauts! Some students will "crack" the code while others may work methodically through until they have filled in all the blanks. Either way this is a great primer for coding, problem solving and mathematical thinking.

To help students break the code, start by identifying the letters you already have (e.g. B = E, E = H, F = I etc). Write the alphabet up on the board and write the corresponding letters underneath as you decode them. Can you see a pattern forming? A visual intervention may help some pupils grasp this more easily, so ask one of the students to draw a line from the letter on the top to the same letter in the line below and see if they can see a visual pattern forming. Here's an example:

Aha, it looks like each line is going in the same direction! Each letter of the alphabet has moved three spaces along. Now, can your students fill in the rest of the blanks and decode this mysterious message?

Answer:

Hello!

Is this Planet Earth? It's a beautiful view from up here.

Tim Peake,

Signing off!

ZAP! Student can access the decoded answer using the Zappar app for mobile or tablet devices. See Zappar instructions at the link below and note that the mobile/tablet will need to be connected to the internet: http://principiaspacediary.org/using-zap-codes-to-strengthen-digital-literacy/

Questions for the Class

- How do astronauts stay in contact with Mission Control?
- Why do you think communication with Earth is so important for astronauts?
- Why would writing in code be useful?
- Is there internet in space? What would you use the internet for if you were an astronaut on the ISS?
- Using the code in the activity, can you write a space message?

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ACTIVITY 2.1 (CONT.) UNITED IN SPACE

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KS1, KS2, P1-5

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seventy-nine days in space across five missions, but the very first Russian cosmonaut was Yuri Gagarin whose first mission launched on 12 April 1961.

The Japanese space agency JAXA is actually quite new. It was formed in 2003 from the merging of three different agencies. In Japanese こんにちは ("konnichiwa") means hello. Although the Japanese astronaut Koichi Wakata has spent three hundred and forty-seven days in space over four missions, the very first Japanese citizen in space wasn't actually an astronaut! Toyohiro Akiyama flew with the Soviet space agency in December 1990, and he was a journalist! The first Japanese satellite, called Osumi, was launched on 11 February 1970. It weighed only twenty-four kilograms.

Questions for the Class

- What languages do you speak at home or within your family? Can you create a list of languages and greetings that represent you, your friends and your community?
- What about non-verbal communication methods? How do you say 'hello' in British Sign Language, Finger Spelling and Braille?
- What do you notice about the dates of the first missions? What can you discover that might explain the differences?

Extensions & Digital Resources

ZAP! Use the Zappar app to see a slideshow of some of the astronauts who have been to the ISS. This includes astronauts from different countries in Europe plus Russia, the US and Japan. See Zappar instructions at the link below and note that the mobile/tablet will need to be connected to the internet: http://principiaspacediary.org/using-zap-codes-to-strengthen-digital-literacy/