

The ISS: Who's Up There?

Subject/Grade Level:	Space and the Solar System / Middle School (Grades 6-8)
Lesson Objective(s):	Students use the information on the ISS-ABOVE to further research into the astronauts currently and formerly on the International Space Station.
Materials:	<ul style="list-style-type: none"> • ISS-ABOVE - connected and running • Access to the internet for students • Wall map of the world • Push pins
Standards and Objectives:	<p>Human Environment Interaction: Explain how the physical and human characteristics of places and regions are connected to human identities and cultures.</p> <p>Questioning:</p> <ul style="list-style-type: none"> • Develop compelling questions that promote inquiry around key disciplinary concepts and embedded enduring issues <p>Evaluating Sources:</p> <ul style="list-style-type: none"> • Identify and utilize evidence to seek solutions to questions. <p>Communicating</p> <ul style="list-style-type: none"> • Construct viable arguments, relevant explanations and/or public demonstrations that convey ideas and perspectives.
Differentiation strategies to meet diverse learner needs:	<ul style="list-style-type: none"> • <u>Think-pair-share</u>, for students that learn best when engaging with classmates. • <u>Multisensory learning</u>, to accommodate students that are auditory learners and visual learners, as well as encourage students to engage their senses in the learning process. • <u>Awareness of social and cultural backgrounds</u> of students to reinforce the real-life application of what they are learning.
Student Worksheet	Worksheet for students' research on astronauts currently or formerly on the ISS.
Skills Needed	Students will explore motivations and pathways that drive astronauts to take up a career in space exploration.

ENGAGEMENT

Make sure you have the ISS Above Installed so you can see the list of astronauts currently on the ISS above. For example, below is the image of the Expedition 54 Crew as of January 2018. The screen updates as crew members switch out every 3 months:



Questions

1. Where are the astronauts from? (Country – Space Agency: USA – NASA; Russia – Roscosmos; Japan – JAXA)
2. What's the significance of the badge with the yellow border? (This is a mission patch with the names of the astronauts and the mission number. The astronauts wear that patch)
3. There are 15 flags below the badge. What's the significance of those? (These are the 15 countries that collaborated to build the ISS)

EXPLORATION

Activity: Research backgrounds of each of the astronauts that are on the ISS.

In addition, the following prior ISS astronauts reflect diversity/have specific characteristics:

- Peggy Whitson (female Commander on the ISS)
- Jose Hernandez (11-time applicant)
- Scott Kelly (One-Year Mission, twin of Mark Kelly, astronaut)
- Sunita (Sunny) Williams (female Commander on the ISS)
- Anousheh Ansari (self-funded, first Iranian on the ISS)

Students work in pairs to complete the details on the worksheet for each astronaut they choose. Students should research a minimum of 3 astronauts and may use the additional sources to find astronauts other than those mentioned above that have been on ISS missions (they will have to really look at the bios to establish that).

Ideally, students will focus on NASA trained astronauts, so that they can go on the map.

They will:

- Research their background, careers, how long they have been in the program.
<https://www.nasa.gov/astronauts> and <https://en.wikipedia.org>
- Uncover how many different educational and work backgrounds they come from: army, navy, air force, researchers, medical doctors, teachers.
- Use a pushpin map to mark where the crew members are from.
- Research what physical requirements are needed to be on the ISS?
<https://astronauts.nasa.gov/content/broch00.htm>
- What's available from NASA for them? An exploration of
<https://www.nasa.gov/audience/forstudents/index.html>

Additional sources:

https://en.wikipedia.org/wiki/List_of_astronauts_by_name

https://en.wikipedia.org/wiki/List_of_astronauts_by_year_of_selection#1997

<http://www.cbsnews.com/network/news/space/home/flightdata/personnel.html>

EXPLANATION

By researching the backgrounds of the astronauts, students can see what it takes to become one educationally and physically, and what other useful skills could be utilized in space.

ELABORATION

Have students pick the astronaut they best relate to. They can either:

1. Create a short presentation about their astronaut and why they believe they wanted to join the space program and why they relate to them.

OR

2. Write a letter to the astronaut they relate to the most.

Letters can be sent to:

Astronaut Office/CB

NASA Johnson Space Center

Houston, TX 77058

EVALUATION

Students can clearly articulate their analysis of the diversity of astronaut backgrounds (also including that astronauts come from many countries).

Ask students to write an essay about themselves in the future, when they've just been accepted on the astronaut training program at NASA. They should write their own bio up to that point. Also, they should cover what are they're now looking forward to.

Student Worksheet – Living in Space: Who’s Up There?

Part 1: Review the following online sources and pick 2-3 astronauts to research. Record their details on the other side of the worksheet.

Some astronauts you can choose (pick 2-3 to research):

- The US astronauts on ISS right now (see your ISS-ABOVE screen).

Also consider:

- Peggy Whitson (female Commander on the ISS)
- Jose Hernandez (11-time applicant)
- Scott Kelly (One-Year Mission, twin of Mark Kelly, astronaut)
- Sunita (Sunny) Williams (female Commander on the ISS)
- Anousheh Ansari (self-funded, first Iranian)

Or, pick your own. Just make sure they’re part of the NASA program (especially if your Russian isn’t all that good).

URLs:

Places to look for lists of astronauts:

https://en.wikipedia.org/wiki/List_of_astronauts_by_name

https://en.wikipedia.org/wiki/List_of_astronauts_by_year_of_selection#1997

<https://www.nasa.gov/astronauts> (for the current ISS astronauts)

<http://www.cbsnews.com/network/news/space/home/flightdata/personnel.html> (bios from an earlier, recent, mission)

<https://en.wikipedia.org> (you’ll need a name to search for them on Wikipedia, but most astronaut bios are out there)

[Gather the details needed for the tables on the other side of the sheet.](#)

[If you have time, explore some more:](#)

<https://astronauts.nasa.gov/content/broch00.htm> (what do astronaut candidates need to be considered for NASA training)

<https://www.nasa.gov/audience/forstudents/index.html> (how can I engage with NASA)

NOTE: More than 100,000 people work for space agencies around the world to support the ISS, as well as more than 500 contractor facilities in 37 US states and 16 countries. 68 countries have been involved in research onboard the station.

Student Worksheet – Living in Space: Who’s Up There?

Part 2: Complete a bio synopsis for each astronaut you research in detail (you should do 2-3 bios). Your list of online sources is on the other side of the sheet.

Name		Name		Name	
Born (place, year)		Born (place, year)		Born (place, year)	
Education		Education		Education	
Career		Career		Career	
Year joined NASA		Year joined NASA		Year joined NASA	
Missions		Missions		Missions	
Family		Family		Family	
Hobbies		Hobbies		Hobbies	

Cut out your bio synopses and add them to the push pin map.